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U.S. July Sales Put at 306,000

Operation Slackens; Probable July Production 300,000 Units

by Harold E. Gronseth
Detroit News Editor, Automotive Industries

Motor vehicle retail sales, which lifted to unexpected heights in the final week of June, are back in step with a normal seasonal trend. While holding at a satisfactory level, the month thus far has not produced sensational figures nor indicated anything but a gradual drifting into a slackened summer sales pace. The results to date, however, are not conclusive of what July holds in the way of retail volume for the industry, since the two preceding months have staged strong come-backs after rather listless starts.

Only rough estimates can be made of July retail sales on basis of such figures as are available. These indicate that the passenger car volume for the month may run to 264,000 units and the truck volume to 42,000, giving July a total of 306,000 units. This compares with the estimated 341,000 units in June and with registrations of 266,496 cars and trucks in July, 1934.

Retail sales are now running ahead of production and are cutting into dealer inventories which for the industry as a whole are not excessive. Heavier inroads on stocks will be made next month when a sharp curtailment in output is expected as a number of plants close for inventory and changeover. Despite the slowing down of operations already in evidence, July schedules call for more than 300,000 cars and trucks. Since this figure includes production for both domestic and foreign sales, the number going into the domestic market will be somewhat under the estimated sales for July.

Used car sales are still holding strong and the manufacturers, while conducting a systematic campaign among their dealers, do not appear worried about the condition of stocks. One of the largest sales organizations experienced a reduction in stocks during the first 10 days of July.

Sales executives continue to extol the farm market which is producing heavy sales gains and holds promise of being an important sustaining factor in the retail volume for the last half of the year. One of the leading companies reports that deliveries in the farm market increased twice as fast as total new car sales during the first four months. The increased purchasing power of agricultural districts the country over is one of the bright spots in the business picture. That is the consensus of all sales officials

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Hudson Second Quarter Profit Exceeds First

Preliminary figures indicate the Hudson Motor Car Co.'s profit in the second quarter as finally reported will be greater than in the first quarter this year when a net profit of $235,610 was shown, the largest earnings for any quarter since 1931, according to A. E. Barit, vice-president and general manager.

Mr. Barit stated the company's cash holdings had increased steadily in the past three months and were now at the highest figure of the year. Retail sales in June were 24 per cent greater than in June 1934, and were the largest for any June in the past 5 years. Mr. Barit said that orders received in July to date indicate the record rate of retail sales will be continued throughout the present month.

Market Analysis for the Wealth Sharers

If you had an income in 1933 of more than $3,930, you were included in the one per cent of the income receivers with the largest incomes in that year, according to data given by Col. Leonard P. Ayres in the current issue of the Business Bulletin of the Cleveland Trust Co. In 1933, this one per cent had an aggregate income of $5,000,000,000, out of a national total of $47,000,000,000.

Commenting on the data, Col. Ayres says: "If the government had taken in 1933 the entire income of the richest one per cent in excess of $3,930 per person, the additional amount taken would have paid hardly more than half the federal deficit of that year, and if it had distributed that excess among the remaining 99 per cent of the income receivers each one of them would have had his monthly income increased by less than five dollars per month."

Knudsen Main Speaker at National Safety Congress

William S. Knudsen, executive vice-president of General Motors, will be the principal speaker at the first day of the annual meeting of the National Safety Congress and Exposition in Louisville, October 14-18.

Another speaker on the program will be Governor Harold G. Hoffman of New Jersey, who is general chairman of the Street and Highway Traffic Section of the National Safety Council. John E. Long, president of the national organization, will preside.

Steel Makers Say No Evidence Yet of Price Cut Drive on New Model Orders

Notwithstanding a well-founded report that an important motor car manufacturer had placed an order for $6,000,000 worth of steel at favorable prices to the buyer, suppliers of automobile steel say that nothing has occurred to indicate that determined efforts will be made to obtain lower prices on steel commitments for new models. The order covered partially fabricated material and therefore is regarded as not having the same influence on prices as would, for example, a contract covering sheets, bars, etc.

Imminence of buying for new model requirements has centered strong interest about the steel price structure. Some question that it will stand up without the code. It may be wishful thinking, but steel men are of the opinion that prices will remain firm at present levels. They see little possibility of cutting costs with profits where they are, and with their experience under Gov-

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Average Dealer Franchise Must Be A Profitable One, R. H. Grant Says

Declaring that the average dealer franchise must be a profitable one, R. H. Grant, vice-president of General Motors, met the issue of more new car gross profit for dealers in a frank speech before the Texas Automotive Dealers Association which is reported in the current issue of the NADA bulletin.

He indicated strongly that more discount alone was not the answer unless underlying causes were dealt with. He said "You cannot tackle the gross profit on new cars unless you simultaneously deal with the losses on used cars, because the two things are so interrelated that you cannot handle them separately. If used car losses go up, you can depend on it that the gross on new cars will have to go up, or you cannot stay in business. If I could . . . wave a magic wand and guarantee that there would be no used car losses, you would quit your worries in your new car gross. So it is the relation of the two things that is very important."

While Mr. Grant said he was willing to accept whatever method of controlling used car losses that would do the trick, he indicated that he felt that some more flexible scheme was needed than the rigid schedule of top allowances in effect under the code. This flexibility he held desirable to meet individual conditions.

Taking up the matter of packing too many dealers into a territory, he declared "Another consideration is this: That dealers be properly placed according to the potential of the territory, and not by hunch or rule of thumb, or a design to run up a high price class, but really on a scientific basis of the potential. . . ."

Describing the dealer who is losing money and at the same time overtrading as the greatest menace in the automobile business, he expressed the opinion that such dealers should be barred from overtrading if some legal way can be found to stop them.

Although endorsing the Official Used Car Guide Book, he expressed the hope that it might be possible for a certain number of manufacturers' representatives to sit in on the planning and setting up of the book in return for which GM would urge its dealers to send in reports. This would put a broader coverage behind the averages in the book.

Mr. Grant also recognized the problem presented by cross-selling under open territory, and said closed territory could be made to work on the smaller volume lines, but not on Chevrolet and that Chevrolet dealers wouldn't want it. In the case of Chevrolet, the number of cars likely to be sold in a city by fringe dealers is now deducted from the potential of the city which is used in arriving at the city set-up.

Pointing out that production starts three months in advance of the time dealer gets the cars, Mr. Grant said that in the event a bad guess on the market resulted in an excessive supply, "some method must be gotten up where the whole cost of liquidation can't be assumed by the dealers."

In connection with over-packing dealers, Mr. Grant revealed that GM had a corps of men surveying the larger cities from this standpoint and that the facts developed were being analyzed at headquarters. From them the ideal set-up was being determined, compared with the existing set-up and a practical set-up then projected. The practical setup, of course, takes into consideration the equities of existing dealers who should not be eliminated arbitrarily.

New Drafting Standard

Copies of the American Standard Drawings and Drafting Room Practice, which has been approved by the American Standards Association, and copies may be obtained at 50 cents each from that association or from any of the cooperating organizations, included among which is the Society of Automotive Engineers. The address of both the SAE and the ASA is 29 West 39th St., New York. The new standard practice covers such matters as arrangement of view, line work, dimensioning, sheet sizes and lettering.

Packard Makes Profit In Second Quarter

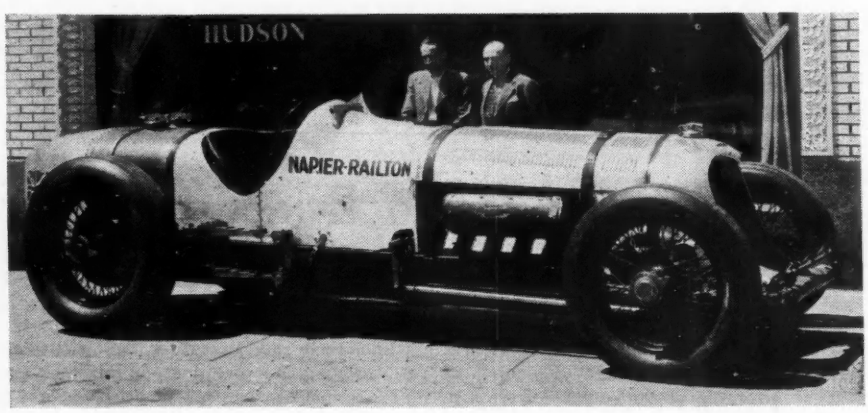
Packard Motor Car Co. will show net profit of approximately $1,400,000 for the quarter ended June 30, 1935, according to Alvan Macauley, president. This represents the first profitable operations since the fourth quarter of 1933 and reflects the result of the first full quarter's production of the company's new lower-priced line of cars. Output of 17,040 cars compared with 1241 in the second quarter of 1934 when net loss was $1,711,123.

First quarter this year, in which production amounted to only 3839 cars, absorbed heavy charges incident to production and introduction of the new model and resulted in a loss of $1,210,162 which brings estimated profit for the first six months to around $200,000.

After payment of everything except current bills, cash at the end of the first half amounted to approximately $9,600,000, an increase of roughly $3,350,000 over the March 31 total.

Guide Book Allowances 25% Under Sales Price

Used car allowances values in the July Official Used Car Guide Book are figured at the average selling price of cars in average condition, less 25 per cent, as against a 15 per cent reduction during the code era. The NADA says that cars in average condition can safely be taken in trade at the published figure if the dealer will sell them at 33 1/3 per cent mark-up on that value. This seems to mean that if the dealer knows the price at which he can sell a used car, he can safely allow 75 per cent of that price, although what need he would have for a Guide Book in that case isn't clear.



The Napier-Railton race car in which John Cobb, English broker and sportsman, covered 152.11 miles in one hour on the Bonneville salt beds. Six new world records and 12 American records are reported to have been set by Cobb with this car. The car is shown as it was taken from its crate at the Hudson distributor's headquarters in Salt Lake City, it weighs 4100 pounds; is fitted with a Napier airplane type engine rated at 450 hp.

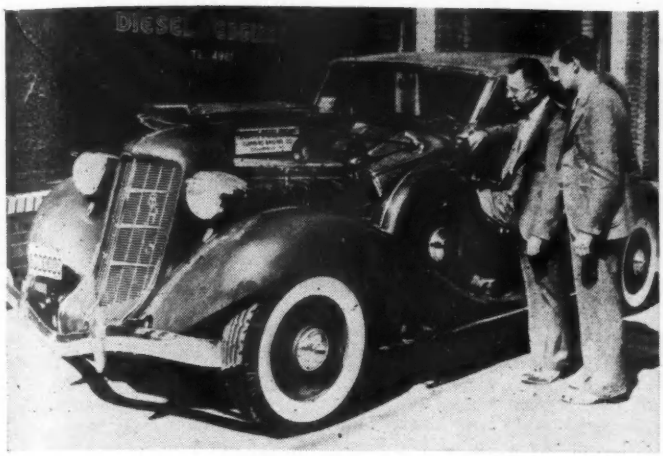
Auburn Second Quarter Net Loss $410,890

Consolidated net loss of the Auburn Automobile Co. and subsidiaries for the second quarter of 1935 ended May 31 and comprising the months of March, April and May, was $410,890, it was announced. This compares with a consolidated net loss of $788,071 for the like period of 1934. For the six months ended May 31 the company's net loss, compiled from quarterly reports, amounted to $862,487, corresponding to $1,645,466 in the same six months of 1934.

The consolidated balance sheet shows total current assets of $5,227,097 and total current liabilities of $821,718.

F. W. Thompson Joins FWD

F. W. Thompson of Appleton, Wisconsin, has joined the force of the Four Wheel Drive Auto Company, Clintonville, Wis. He is employed as the director of research.



C. L. Cummins, Diesel engine manufacturer shown with his car in Los Angeles at the conclusion of his trans-continental economy run. Mr. Cummins is at the left and with him is Fred Duesenberg, son of August Duesenburg. The fuel cost was $7.63 for the coast-to-coast trip.

Ford Sells 634,961 Units in First Half

June Total 100,882; 4th Consecutive Month This Year to Exceed 100,000

Figures announced this week by officials of the Ford Motor Company that during the first six months of the year, 634,961 units were sold in the United States. This is nearly two-thirds of the 1,000,000 cars and trucks which Ford expects to build this year. This figure does not include foreign sales.

In June alone, 100,882 units were sold. This is the best sales record for June that Ford has experienced since 1930—and the fourth consecutive month this year that Ford sales have topped 100,000. During the first six months this year, Ford paid out $88,727,568 in wages and spent $374,368,873 for raw materials, a great part of which was for wages in other industries.

New Yellow Cab Wheelbase 133½ in.; 300 lbs. Lighter

A hand-built model, the first of a fleet of 1000 new taxicabs for the Yellow Cab Company of Chicago, was inspected last week by city officials, including Thomas Gordon, public vehicle license commissioner; George Fleming, chairman of Mayor Kelly's safety committee; Thomas B. Hogan, president of Yellow Cab, and Morris Markin, president of Checker Cab Manufacturing Company, makers of the car. Delivery of the balance of the order will start early in August at a cost of $1,350,000.

The new cab has a wheelbase of 133½ inches, compared with 127½ inches in the old cabs. It is 300 pounds lighter, the heaviest models weighing 4800 pounds. The new cabs have a full length running board with drop skirts on the fenders. No spare tires are carried, as the tires are equipped with puncture-proof tubes. The doors have been widened considerably. The windows are of shatter-proof glass. Four wheel hydraulic brakes are standard equipment on all models. Larger tires are used to permit running on lower air pressure. The body is mounted on roll spring points. Eight-cylinder Lycoming engines designed especially for quick pick-up and smooth running are standard equipment.

The Checker Cab Manufacturing Company claim these models to be the latest in automotive streamlining. They are trimmed in chromium with black patent leather top. A chrome yellow, somewhat lighted than the familiar yellow now in use, is used on the body. The interior is trimmed in mohair.

Jenkins Smashes 70 Marks In Auburn Stock Car Test

Piloted by Ab Jenkins, on the Bonneville salt flats, a stock super-charged Auburn is reported to have smashed 70 unlimited and American class speed records for stock cars. In the first five miles the Auburn averaged 104.395 m.p.h. and over the 1000 mile route 102.7733 m.p.h. The car also raced at the speed of 103.6955 m.p.h. for one hour; 103.033 m.p.h. for 500 miles.

Figures of the AAA Contest Board show that in the American Class C open car division, Jenkins in the Auburn, swept the boards clean from one to 3000 kilometers and from one to 2000 miles. In addition the Auburn is credited with new records in this class for one, six, 12 and 24 hours of running. Temperatures during the run reached as high as 108 degrees.

Cleveland Railway to Buy 20 White "Pancake" Buses

The Cleveland Railway Co. has announced it will purchase 20 new 32-passenger motor buses from the White Motor Co. The buses will be of the new "pancake" motor type. One of this type of White bus has been experimented with by the railway company and found highly satisfactory.

Cleveland Railway also announced its intention to inaugurate the city's first trackless trolley coach line. It will purchase 20 trolley coaches for this service. The company has been studying the Mack trackless trolley but has not yet placed its order.

States Seek Caravaning Halt Through Taxation

Aimed at vehicles caravaned or driven into states for sale, California, Texas and Nebraska has recently passed special legislation providing for taxation of such vehicles.

The new California law charges $15 per vehicle driven or towed into the state for sale therein. In Nebraska, the law now excepts such vehicles from the reciprocity provisions and requires that they be licensed. In Texas, a registration fee of $3 must now be paid on such vehicles.

Other states which have legislated along this general line are Wyoming, Nevada, New Mexico, Arkansas and Oklahoma.

NSPA Jobber Sales Study Report Issued

A three-part report analyzing information on sales and sales management received from jobber members is being mailed by the National Standard Parts Association, Detroit.

The entire survey has been broken down into five volume classifications in order that every jobber may compare facts and figures on his own business with those of other jobbers doing similar volumes, as reported in the survey. Information is also divided as between jobbers operating in metropolitan centers and those in the less thickly populated areas.

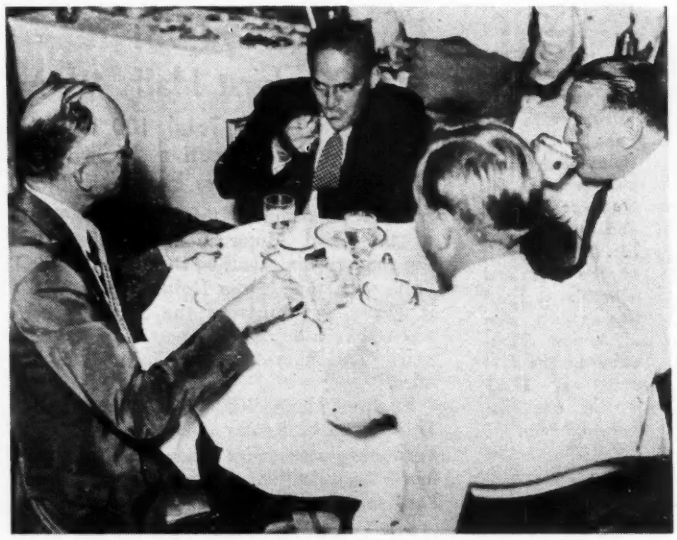
Another division breaks down the information as between jobbers operating only one main store, with perhaps several merchandising trucks covering the territory, and those jobbers operating an organization with one or more branch stores.

Part I of the survey deals with volume and costs and reports the changes in jobbers' sales volumes during the past year and, what is more important, shows to just what factors jobbers attribute these changes. Just as an example, 49 per cent of those reporting stated that the addition of new lines was responsible for their increased volumes and a list of these lines is included, together with the number of jobbers showing increases who are carrying them.

Thirty-five per cent of those reporting showed a lower percentage cost of doing business and stated that this was due, in part, to the spreading of overhead on a larger volume, and also partly due to better management methods now being used. At the same time, 65 per cent report an increase in costs due to NRA with its shorter hours and longer wages and also due to increased margins.

Part II of the report is a study of current sales management methods which are broken down under five headings: 1. Developing better sales outlets. 2. Organization inside the office. 3. Supervision and training of salesmen. 4. Advertising methods. 5. Complete coverage of accounts and prospects.

Part III deals with distribution methods and territories and presents the previously referred to comparison of the experience of jobbers in large cities with those in agricultural territories, and another comparison of jobbers operating branches with those operating merchandise trucks.



NSPA board members at lunch during the recent meeting in Detroit. From left to right they are D. W. Rodger, Federal - Mogul; L. F. Woolman, Allen Electric; B. Paterson, Thompson Products, and Hugh Moore, NSPA

Roberts Leaves Packard, to Retire from Business

E. F. Roberts, vice-president in charge of manufacturing of Packard Motor Car Co. and a veteran of nearly 40 years in the automobile industry, has resigned to retire from active business. He plans a year or two of world travel. Now 61, Mr. Roberts became a machinist's apprentice in Hartford, Conn., when 14. As a machinist, and later an expert tool maker, he was actively engaged in the early experimental work in the east on horseless carriages.

Mr. Roberts joined Packard at Warren, Ohio, 32 years ago as a tool maker, and had an important part in development of the early Packards and later supervised the building of several hundred thousand Packard cars and trucks. He was credited with creating many important processes and machines now used in the industry, best known of which is the machine for cutting spiral bevel gears for automobile rear axles. In point of years of service he is believed to be one of the oldest automobile manufacturing executives.

R. A. Lind to Head "Toledo Plan" Work

McGrady Scheme to Handle Labor Disputes Opposed by Green; Won't Cooperate

Ralph A. Lind, former director of Regional Labor Board, Cleveland, has been named chairman of the panel of nine industrial leaders and nine labor leaders to put into operation the plan of Edward F. McGrady, Assistant Secretary of Labor, for settling industrial disputes in Toledo.

The plan may set a precedent for other communities in the event the Wagner Law is held unconstitutional or fails to operate. Five leaders of labor and industry who formed the temporary committee will also form a temporary panel and Mr. Lind will select four others from each group. Each group will have a chairman and vice-chairman and they will rotate monthly. On arbitrations, Mr. Lind will call in the chairman from each group to sit with him. Labor and industry agree to no strikes, lockouts or discriminations while any matter is before the board. Speedy action is also provided. Mr. Lind served with Charles P. Taft, 2nd, in settlement of the Auto-Lite strike last year.

Although the set-up, which has come to be known as the "Toledo Plan", was proposed by Mr. McGrady, formerly an important A. F. of L. official, it was attacked this week by William Green, AFL president, as "unworkable and impracticable." Mr. Green said the Federation would not cooperate because company union representatives might be included among the labor men on the panels. He also pointed to the effect of possible delays in effecting a settlement on labor's position.

ASA Approves Standard Sizes of Jig Bushings

An American Standard for Jig Bushings, giving dimensions for press fit wearing bushings (headless and head types), renewable wearing bushings (slip and plain types), and liner bushings (headless and head types), has been approved by the American Standards Association and has now been published.

The new standard gives tables for dimensions covering range of hole, body diameter, length, width of chamfer, head diameter, and head height. The hole sizes are in accordance with the proposed American Standard for Twist Drill Sizes.

Copies of the approved American Standard for Jig Bushings B5.6-1935, are available from the sponsors or from the American Standards Association, 29 W. 39th St., New York. The price is 35 cents a copy.

James L. Sinyard

James L. Sinyard, former director and sales manager of the A. O. Smith Corp., died this week at his Milwaukee home. He was 71 years old. Mr. Sinyard went to Milwaukee in 1897 to join the sales department of C. J. Smith & Sons Co., then makers of bicycle parts and parent company of the present Smith Corp. Mr. Sinyard retired from active work in 1921 and continued with the company in an advisory capacity until 1925.

New Alloy May Be Useful In Piston Construction

Campbell, Wyant & Cannon Foundry Co. has been very much embarrassed by recent reports concerning the development of a light steel piston, said to be as light as aluminum. In an interview with a representative of *Automotive Industries*, F. B. Whitlock, Campbell, Wyant & Cannon sales manager, said that his company is not in production on a piston of this type nor has it secured the exclusive piston business of one or more of the larger motor builders, as reported.

According to Mr. Whitlock, the company has been doing some experimental work with a special metal alloy that may be adaptable, at some future time, to piston construction. However, all its work to date has been purely experimental and no statement can be made as to its possibilities.

Passage of Eastman Bill Now Looks Sure As House Committee Rejects Substitute

Enactment of the Eastman bill regulating interstate motor carriers in substantially the form approved by the Senate, seemed more nearly a certainty when late last week the House Interstate Commerce Committee rejected the substitute measure drafted by its own sub-committee headed by Representative Huddleston.

The Huddleston Bill, summarized in these columns last week, provided for much less detailed and comprehensive regulation than the Eastman measure, and also called for the establishment of a separate division in, but not subject to, the Interstate Commerce Commission, to administer motor carrier regulation.

The House Committee has appointed a new sub-committee to determine whether or not amendments should be made to the Senate Bill. This sub-committee is composed of Representatives Pettingill, Ind.; Sadowski, Mich.; Terry, Ark.; Reece, Tenn., and Holmes, Mass. It is quite generally anticipated that this sub-committee will advise the full committee to report the bill in substantially the form passed by the Senate, and that the full committee will follow this advice. It is expected that the House will pass the measure at this session which means that it will become law as the President has endorsed it.

Straight-Time Rate Prevails in Motor Industry Despite Trend to Bonus Plan

Premium and bonus systems of wage payments in effect in 1935 cover approximately three times as many wage earners as in 1924, according to data collected by the National Industrial Conference Board in a survey of financial incentives in modern industry. The proportion of wage earners on piece rates has dropped two-fifths in the same interval, while the proportion on time rates is virtually unchanged.

The Conference Board's report covers 631 companies employing more than 700,000 wage earners.

Premium or bonus plans are relatively more popular in the medium-size plants than in either the very small or very large establishments. In plants employing between 250 and 999 wage earners, 23.2 per cent were being paid under premium or bonus plans. In plants employing from 1000 to 4999 the proportion was 24.4 per cent. This contrasts with the percentages in the small plants and large plants, 14.1 per cent and 19.9 per cent respectively.

Straight-time rates are most common in the automotive industry, where 83.4 per cent of the workers are paid on that basis.

Reports from the printing and publishing establishments indicate that 54.0 per cent of the wage earners are on premium or bonus plans, 44.0 per cent on straight time and only 2.0 per cent on individual piece rates.

The NRA, according to reports received by the Conference Board, did not have a uniform effect on wage incentive plans in all plants. Three times as many companies reported that the NRA had increased the use of incentives as found that it had the opposite effect.

The main reason for the increased use of incentives on account of the NRA was the need for greater economy. This need arose from the increase in costs resulting from reduction in working hours and the establishment of minimum wage scales.

Security Bill Delayed by Co. Pension System Snarl

The Senate and House were deadlocked this week over the retention of the Clark Amendment in the Omnibus Security Bill. This amendment would permit continuation of existing company pension systems and allow the creation of new ones with credit to the company of 90 per cent of the excise and income taxes due provided the funds went to finance the company plan and the Social Security Board approved the latter.

Administration adherents in both branches oppose the provision. House members voted overwhelmingly to return the measure to conference with instructions to its representatives to remain adamant against inclusion of the amendment. At the same time Senator Harrison secured the Senate's permission to return the bill to conference with the understanding the amendment would be adhered to. Howeyer, it was indicated by one House leader that the Clark amendment probably would be compromised by allowing companies having their own pension systems a 10-year period in which to liquidate them and come within the federal system as provided in the bill. Disposition of this amendment is all that is holding up final approval of the legislation.

Clark Co. Alters Plants to Expedite Truck Job

The Clark Equipment Company has announced the removal of the front axle division of the Battle Creek department to Buchanan, Mich., to make room at Battle Creek for the assembling of the trucks for which the company received orders from the Brooklyn and Queens Transit Corp. of New York. The company has received a contract to make 100 trucks and axles for a new type of streamlined street car.

The Buchanan plant is to receive a large share of the work, as the steel castings and the axles will be made in the axle department. The gears for the trucks will be made in the Jackson plant and the smaller parts will be done in the Battle Creek plant. It is expected that three months will be required for the manufacturer and installation of tools and equipment for truck parts before production can be started.

Houdaille-Hershey First Half Profit $1,773,626

Houdaille-Hershey Corp. reports for six months ended June 30, 1935, net profit of $1,773,626, and compares with net profit of $725,818 in the first half of 1934. Net profit in June quarter was $870,757, against $902,869 in the first quarter and $475,562 in second quarter last year. Current assets on June 30, last, including $3,284,135 cash, amounted to $5,974,318, and current liabilities $910,312, compared with cash and Government securities of $1,897,000, current assets of $4,432,605 and current liabilities of $773,844 a year ago.

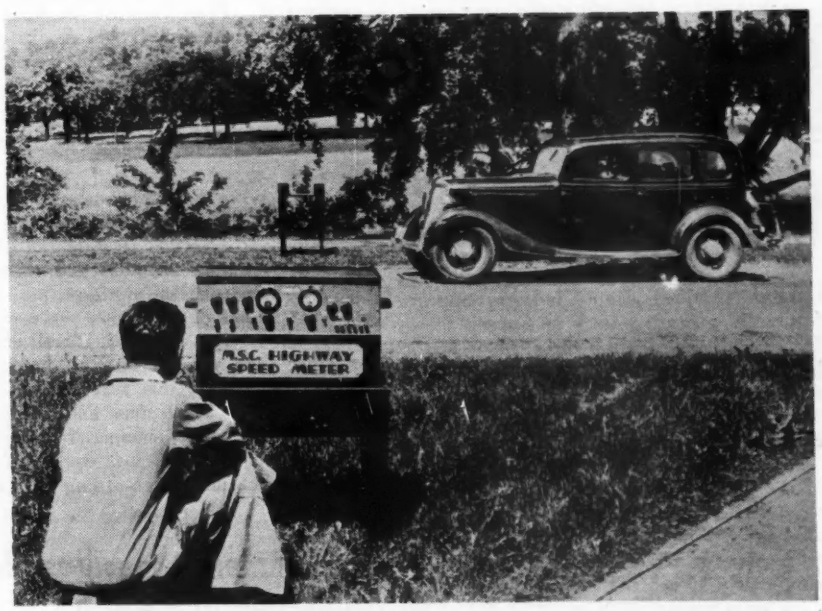
Young First Half Profit Reported as $1,067,585

L. A. Young Spring & Wire Co. reports for six months ended June 30, 1935, net profit of $1,067,585 after charges and taxes or $2.74 a share on 389,198 shares of no par stock against $667,550 or $1.71 a share in first half of 1934. Net profit in the June quarter was $546,653 or $1.41 a share against $520,932 or $1.33 a share in the first quarter and $355,667 or 91 cents a share in second quarter of 1934.

Sales are running well ahead of 1934. Aided largely by heavy Chevrolet production, company's sales this month will show less than seasonal decline. After a slack August when preparations are under way for new model production operations are expected to resume on a heavy scale in September. Diversification of its lines this year has helped the company to increase its sales to present customers.

Bohn Aluminum First Half Net Profit $952,819

Bohn Aluminum & Brass Corp. reports for six months ended June 30, 1935, net profit of $952,819 after charges and federal taxes, this compares with net profit of $1,138,019 for the first six months of 1934. June quarter resulted in net profit of $398,205 against $554,613 in preceding quarter and $488,066 in second quarter last year.



This speed meter, developed by Dr. Harry Silva of the Massachusetts State College, is said to register with negligible error the speed of cars passing it. The car intercepts parallel light beams which are registered on the mechanism. The time taken for the car to pass the second light beam after cutting the first is measured directly on a scale reading in miles per hour.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

There was an improvement in general business last week, with a gain in retail trade. Most industries showed an upward trend, including an increase in steel operations. The number of commercial failures was the smallest since last September, although it was about 7 per cent above that in the corresponding period last year.

Car Loadings Slip

Railway freight loadings during the week ended July 6 amounted to 472,421 cars, which marks a decrease of 145,615 cars below those in the preceding week, a decline of 48,320 cars below those a year ago, and a decline of 71,089 cars below those two years ago.

Food Prices Higher

According to the Bureau of Labor Statistics, retail food prices during the two weeks ended June 18 declined by 0.6 per cent. The current level stands at 23 per cent above the 1913 average and is 12.8 per cent above that a year ago.

Current Production Up

Production of electricity by the electric light and power industry in the United States during the week ended July 6 shows a gain of 6.4 per cent above that in the corresponding period last year.

May Payrolls Down

Factory employment and payrolls during May declined for the first time since November, 1934. There was a decrease in employment amounting to 1.5 per cent, while payrolls fell by 3.2 per cent. The Bureau of Labor Statistics, who furnished these figures, added that there is usually a normal seasonal decline in factory employment during May.

Lumber Output Gains

Production of lumber during the four weeks ended June 29 was 7 per cent above that in the corresponding period last year, while there was an increase of 25 per cent in shipments.

Less Crude Produced

Average daily crude oil production during the week ended July 6 amounted to 2,677,400 barrels, as against 2,689,850 barrels for the preceding week and 2,564,300 barrels for a year ago.

Fisher's Index

Professor Fisher's index of wholesale commodity prices for the week ended July 13 stood at 81.6, as against 81.7 the week before and 81.6 two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended July 10 showed a decrease of $1,000,000 in both holdings of discounted bills and of government securities. Holdings of bills bought in the open market remained unchanged. There was an increase of $4,000,000 in monetary gold stocks and a decrease of $68,000,000 in money in circulation.

Big Export Increase Aids German Diesel Industry

The outlook for further expansion of Germany's Diesel engine industry appears favorable, according to Vice Consul James H. Wright, Cologne, in a report made public by the Commerce Department. The demand in both the domestic and foreign markets, Mr. Wright reports, is progressively increasing.

Exports of Diesel engines from Germany in the first four months of this year registered a noteworthy advance, shipments totaling 3,857 tons, valued at 6,027,000 reichsmarks (Current value of reichsmark approximately 40 cents, U. S.), compared with 2,791 tons, valued at 4,710,000 reichsmarks, in the corresponding period of 1934, it was stated.

German foreign trade statistics show two separate classifications of Diesel engines. According to these official statistics German exports of Diesel engines for use on water craft during the first four months of 1935 amounted to 230 units weighing 985 tons and valued at 2,608,000 reichsmarks against 105 units weighing 553 tons and valued at 1,051,000 reichsmarks during the corresponding period of 1934.

German foreign sales of Diesel engines for other than water craft use during the first four months of this year totalled 1,577 units weighing 2,869 tons and valued at 4,019,000 reichsmarks compared with 1,317 engines weighing 2,238 tons and valued at 3,659,000 reichsmarks, according to the report.

Government Measures Hit Truck Use in Austria

As a result of drastic government regulatory measures the use of motor trucks in Austria is being sharply curtailed, according to advices to the Commerce Department from Gardner Richardson, Commercial Attache at Vienna. These restrictive measures include compulsory minimum tariff in commercial trucking, distance limitations, interdiction of return freight, and the prohibition against carrying persons or goods not belonging to the enterprise owning the truck.

While during 1934 new passenger car registrations in Austria increased 23 per cent, registrations of trucks declined 13.9 per cent, and 43.8 per cent as compared with 1932. Of all European countries besides Austria, it is pointed out, only France, Italy, and Czechoslovakia show a decline in truck registrations.

Car Industry Created 14.4% of '34 Freight

Swayne Discloses Roads Earned $365,021,000 From Automotive Shipments

One-third of the carloads of manufactured freight shipped on the railroads can be traced to the automobile, according to Alfred H. Swayne, chairman of the Traffic Committee, Automobile Manufacturers Association, and vice-president of General Motors.

"In 1934," said Mr. Swayne, citing figures obtained from the Interstate Commerce Commission records, "the railroads handled 6,833,558 carloads of revenue freight classified as 'manufactures and miscellaneous' by the Commission. Figures compiled by the Automobile Manufacturers Association indicate that 2,258,000 carloads of this freight can be traced to the automobile. The items are motor vehicles, parts and tires, 472,505 carloads; iron and steel used in motor vehicle manufacture 153,000; oil and other supplies 270,500; gasoline for automobiles 1,140,000; cement for roads and bridges 222,000.

"The Commission's statistics disclose the extent to which the railroads profited from the increased production of automobiles. Shipments of motor vehicles, parts and tires increased in 1934 to 472,505 carloads compared with 295,999 carloads in 1933. Railroad earnings on this freight increased to $84,843,608, a gain of $30,281,442 over the previous year.

"Gravel, sand, stone and crude petroleum for roads, coal and lumber used at the automobile plants accounted for 806,800 carloads in the Commission's figures on products of forests and mines, or more than 8 per cent of the total in that classification.

"Our studies indicate," said Mr. Swayne, "that of the total revenue carload freight of all kinds carried by the railroads in 1934, 3,064,800 carloads or 14.4 per cent producing $365,021,000 in freight earnings, were derived from shipping that can be traced to the manufacture and use of automobiles."

Robert T. Keller Marries Maxine Smith in Detroit

Robert Thomas Keller, son of Mr. and Mrs. K. T. Keller, was married to Maxine Smith, daughter of Mr. and Mrs. LeRoy A. Smith, in St. Paul's Cathedral, Detroit, Wednesday evening, July 10. Mr. Keller is president and general manager of Dodge Brothers Corp.

Steel Rate High On Automotive Demand

Shortage of Stocks and Labor Reported; Buyers Warned on Order Delays

Automotive demand is responsible for an impressively high rate of steel mill operations for this time of the year, the current week's rate of ingot output being placed by the American Iron and Steel Institute at 39.9 per cent. Even in the historical good steel years of the past, such a rate in the third week of July was looked upon as highly satisfactory. Finishing mills in most districts report a steady influx of orders from motor car manufacturers and parts makers, none individually calling for very large tonnages and nearly all for immediate shipment, but in the aggregate sufficient to permit of much better operating schedules than looked for in midsummer.

It is significant that shortage of steel stocks as well as shortage of steel labor have become topics of market discussion. It is pointed out that in the last few years many skilled steel operatives have been lost to the industry, some through disability or death and some to other occupations, while there has been little or no opportunity to train younger men to take their places. With reference to shortage of steel stocks, sellers say that consumers' stocks are virtually nil. They even go so far as to predict that if there is undue delaying of Fall commitments, buyers may be confronted, when it comes to some descriptions of steel, such as full-finished sheets, with neck-of-the-bottle conditions at mills and that they will then have to take pot luck in the matter of deliveries.

"Hard boiled" buyers look upon all of this as part of the jockeying for position preparatory to the shaping of the market's price structure for the year's final period. In some quarters of the market it is taken for granted that prices will continue to be made in the same way as heretofore, while others look for a far-reaching change.

Pig Iron—A much better tone prevails in all markets and buying by automotive foundries has broadened. In the Middle West sentiment has now veered around to predictions that the year's last quarter will furnish more activity than did its second quarter, the latter being usually the year's heaviest buying season. All in all, blast furnace interests look for a third more business in 1935 than came to them in the preceding year. Prices are unchanged.

Copper—Although there had been predictions late last week that the price of copper would be marked fractionally higher at the beginning of this week's business, the market remained unchanged on Monday, with the demand continuing heavy and thus paving the way for the 8¼ cent price, which it was said would become effective before long. Sales on Saturday had exceeded 15,000 tons. A conference of producers is being held in London, the United States being represented by three copper men.

Largest Road Tanker Has Capacity of 9050 Gals.

What is said to be the largest tanker on the road has been placed in operation by the A. L. Kauffman Cartage of Detroit. This unit is a train consisting of a tractor, semi-trailer, and trailer. It carries 9050 gall. gasoline. At present the unit is hauled by an old tractor, making the overall length too long for the road regulations which take effect January, 1936. It is planned to build a diesel-powered, cab-over-engine tractor to handle this unit, cutting over four feet from the overall length.

The semi-trailer is fitted with a special Timkin dual axle. A ball-and-socket fifth wheel is used at the tractor. Chief feature of the two tanks is the frameless construction in which the tank itself serves as the chassis. The tank units were designed and constructed by the Columbian Steel Tank Co., Kansas City, Mo.

New Parts Company Begins Operations in Cleveland

A new auto parts manufacturing concern began business in Cleveland this week when the E. W. Ferry Products Co. opened its new plant for the manufacture of connecting rod bolts, fly wheel bolts, cap screws, screws and stainless steel.

The new company was formed by Edward W. Ferry who broke away from the long-established business of the Ferry Cap & Screw Co. founded by his father more than 25 years ago. The older firm was established in 1907 by the late Thomas Ferry. Mr. Ferry said his company already has several orders for immediate delivery.

Mr. Ferry said he left his father's old plant after a difference on financing plans. A heavy stockholder, he will remain as a member of the board of directors. Charles B. Lansing, president of Ferry Cap & Screw would not comment on the launching of the competing company.

Battery Makers to Meet In Chicago During Oct.

The National Battery Manufacturers' Association, Inc., annual fall convention will be held in Chicago sometime between Oct. 1 and 15, the exact dates to be announced later.

API Reports Retail Gas Price Drops 3% in Year

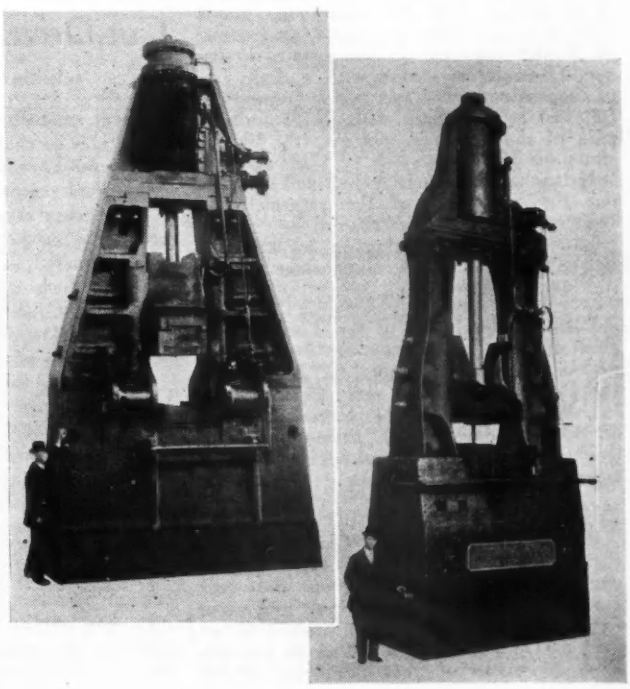
Figures compiled by the American Petroleum Industries Committee of the API indicate that the retail price of gasoline has declined three per cent during the past 12 months while, under efforts of the government to raise commodity prices the wholesale price of petroleum products has increased approximately four per cent. The committee's report shows that petroleum prices are about 52.2 per cent of normal as compared with other commodities which are about 80 per cent of normal. The study also revealed that gasoline prices 10 years ago were approximately 45 per cent higher than today. The average price of gasoline per gallon to consumers on July 1, exclusive of tax, was 13.9 cents per gallon and the average gasoline tax on that date was 5.32 cents per gallon.

A break down of the committee's survey showed that in the various regions of the country average gasoline prices on July 1 of this year were: New England states, 12.3 cents; Middle Atlantic states, 12.9 cents; South Atlantic states, 13.1 cents; Southeastern states, 14.25 cents; Great Lake states, 14.1 cents; Southwestern states, 12.9 cents; Mountain states, 16.5 cents; Pacific Coast states, 15.8 cents.

Brake Lining Sales Up 13½% in '34 Over '33

Sales of brake linings and clutch facings by United States manufacturers during 1934 totaled $17,161,000, an increase of 13½% over the previous year, when sales were $15,120,000, according to the Brake Lining Manufacturers' Association, Inc.

Sales for the industry in 1934 showed an increase of 26% compared with sales during 1932, the low year of the depression, but were only 59% of the 1929 volume. The Association indicated that the improvement since 1932 is due, largely, to the increase in automobile production.



Model E Chambersburg steam drop hammer, recently placed on the market, shows an interesting contrast with its predecessor of 25 years ago (right). Both hammers are of 12,000 lb. capacity — but what a difference in appearance and performance.

New 21 passenger bus on Ford V-8 chassis built by Ottawa Car Co. for the Toronto Transportation Commission. Three buses will be built. The first of this type were introduce in Winnipeg.

U. S. July Sales Put at 306,000

(*Continued from page* 65)

who return from personal surveys of the field.

H. G. Moock, vice-president of Plymouth, who has just returned from a trip through the farm belt, pointed out how the increased farm income has affected automobile sales.

"Our retail deliveries in the farm market during May show a gain of 99 per cent over the same period last year," he said. "Total new car sales gained 48.2 per cent in the four-month period. Farm sales increased to 7.7 per cent of the total for the first four months this year from 5.8 per cent last year.

Prices on farm products are increasing faster than the prices on commodities the farmer has to buy and the improvement is nationwide. The average income, per farmer, has increased in every state in the Union during the past two years. Gains in the income, per farmer, range as high as $858 in Wyoming, $775 in Nebraska and $743 in Iowa. Other states report marked increases.

New car registration returns from 27 states for the month of June show a total of 104,502 as against 87,460 for the same states during June, 1934, an increase of about 20 per cent. For these same states. Ford is in the lead with 31,004, an increase of 26 per cent over the same states a year ago, Chevrolet is second with a slight loss of approximately 3 per cent from 1934, followed by Plymouth with 15,761 units, a gain of about 13 per cent over the like 27 states for 1934.

If this same ratio is maintained throughout the remainder of the returns, total registrations for June should be in the neighborhood of approximately 267,000. This would make the highest June since 1929.

Dodge

Deliveries total 207,270 Jan. 1 to July 13, gain of 55.3 per cent over similar 1934 period. . . . Of year's total 177,543, Dodge and Plymouth passenger cars; 29,727 trucks. . . . Week ended July 13 showed deliveries of 4015 Dodges; 2460 Plymouths, 1174 trucks, total of 7639 units against 6140 in corresponding week last year.

Chrysler

Dealers delivered 1001 Chryslers, 3868 Plymouths for total of 4687 cars in week ended July 13, gain of 9.2 per cent over preceding week and 10.5 per cent over same week year ago. . . . Chrysler dealers within 3600 cars of total 1934 deliveries on July 13. First 28 weeks of year producing 89,700 Plymouth and 25,539 Chrysler sales, representing respective gains of 33.1 per cent, 87.5 per cent and 42.2 per cent over corresponding 1934 period.

Pontiac

June U. S. deliveries 15,646 cars. . . . Six months' total 83,317. . . . Compares with 44,386 in first half of 1934 and 73,620 for all of last year. . . . June retail sales within 1500 of April, best Pontiac sales month since June, 1929, and compares with 9362 for June last year.

Graham-Paige

Report deliveries of 819 cars from June 20 to June 30, highest for any 10-day period this year. . . . First 10 days of July reported at high rate.

Chevrolet

June sales set all-time record with 18,380 truck deliveries, gain of 2793 over preceding month and 22 per cent increase over same month of 1934. . . . Standard model sales for June 137,128 units, gain of more than 366 per cent over corresponding period of 1934.

Studebaker

June production up eight per cent over June last year. . . . Output reached 4583 trucks and cars comparing with 4246 units same month year ago.

No Steel Price Cut Drive Yet

(*Continued from page* 65)

ernment supervision they have confidence in being able to control the situation. At least they have avowed intentions of sticking to established prices.

As yet they say no effort has been made to break the market, but considerable testing is anticipated before volume business is placed. Such testing, it is believed, however, will be for the purpose of making sure that no weakness has developed, rather than with the idea of driving down prices.

Ford Motor Co. is said to be in the market for between 50,000 and 100,000 tons, which will provide the first test of prices.

Little new business has been placed to date. Inquiries are coming in and some feeling out of prices is being done. A few small orders have been received, principally try-outs, the bulk of recent specifications being extensions of old contracts to clean up on current models. A fair amount of tonnage may come out in August, but the real heavy buying is not expected until September. Last year, with new model introductions around Jan. 1, volume steel buying did not commence until the first of December.

If no concessions are granted, at least this much can be said for the present arrangement from the standpoint of the motor companies: each knows what the other is paying. Once concessions are made, no one can be sure who has the price advantage.

AC Develops Spark Plug for Radio Equipped Cars

AC Spark Plug Co. reports the development of a new type spark plug for cars equipped with radio. A resistor unit built into the insulator can be removed and replaced when it becomes inaffective without replacing the entire spark plug. Because the resistor unit is close to the point where the actual spark takes place in the cylinder, noise or click from the radio receiver is reduced to a minimum thus permitting better radio reception along with good engine performance, according to AC engineers.

U. S. Court Grants Plea to Alter Hupp Case Record

At adjourned hearings Monday, Judge Edward J. Moinet in Federal Court granted motion by Frank E. Robson, counsel for J. Walter Drake, former chairman of Hupp Motor Car Corp., to strike out of the record transcripts of conversations which resulted in formation of the coalition board of directors in the fight for control waged by Mr. Drake and Archie M. Andrews. The latter's attorney, A. M. Lowenthal of New York, had sought to make the oral negotiations a part of the record.

Sports, Business Planes to Feature Aircraft Show

An All-American Aircraft Show will be held at the Detroit City Airport Exposition Hangar, July 20 to 28 inclusive. This is the first show of its kind since 1932 and will feature primarily airplanes for sportsmen pilots and business executives, although other types of planes also will be exhibited.

In addition to aircraft, the exhibits will include power plants and accessories of various kinds. One of the interesting machines to be shown here will be a four-place cabin plane built by Walter Beach. It will be called the four-to-one ratio—it has a cruising speed of 202 m.p.h. and lands at 50.

L-O-F Reports Net Profit of $4,284,316 for 6 Mos.

Libbey-Owens-Ford Glass Co. reported net profits of $4,284,316 for the first half 1935, a gain of $1,751,996 over the like period last year. John D. Biggers, president, reported a substantial gain in sales, especially "a great gain in use of safety glass by the automotive industry."

Buick Advertising Account Transferred to Erwin-Wasey

The Buick advertising account has been transferred to Erwin-Wasey, effective at once.

SAE Production Activity Program in Conjunction with Machine Tool Show

The Production Activity of the Society of Automotive Engineers this week announced the programs for the technical session and the dinner which it will sponsor as its contribution to the Machine Tool Congress to be held in Cleveland concurrently with the Machine Tool Show, Sept. 11 to 21.

The technical session under the direction of the Production Activity will be held Wednesday evening, September 18, at the Hotel Statler and will include the following papers:

Methods of Finishing Transmission Gears by S. O. White, Warner Gear.

Application of Induction Heating in Automotive Production by E. L. Bailey, Dodge Bros.

Rustproofing and Paint Adherence Technique by F. P. Spruance, American Chemical Paint.

Resistance Welding in the Automotive Industry by J. A. Weiger, P. R. Mallory & Co.

A Quick Trip through the Machine Tool Show by J. R. Cox, Thompson Products.

Joseph Geschelin, Detroit Technical Editor of *Automotive Industries*, will preside at this session.

At the dinner meet which will be held on September 19 at the Hotel Statler, D. G. Roos, Studebaker vice-president in charge of engineering and SAE past president, will talk on the Relation between Manufacturing and Engineering. The toastmaster will be V. P. Rumely, vice-president of the Production Activity, while A. T. Colwell, Thompson Products, will preside.

Other sessions covering such topics of automotive interest as surface finishing by cylindrical and internal grinding, cemented carbide cutting material; motion pictures of metal cutting, standardization of machine and tool data, etc., will be staged by the ASME and the ASTE.

Last Service Show Space Application Date Sept. 13

Applications from manufacturers for exhibit space at the Automotive Industries Service Show, to be held Dec. 9 to 13, at Atlantic City, under the sponsorship of the NSPA, MEWA and the MEMA, are running well ahead of last year, according to A. B. Coffman, show manager.

Space drawings will be held in Chicago, at the Hotel Sherman, on Sept. 13, the last date upon which space applications will be received. Applications received prior to Aug. 1 will participate in the first half of the drawing. Those applications received after this date and up to Sept. 13 will participate in the last half, the show management has announced.

Packard Adds Touring Coupe to 120 Line

Packard has added a new body model to its 120 line, a touring coupe with built-in trunk compartment and seating capacity for five, listing at $1,025.

Motor Products Net Profit $693,105 for First Half

Motor Products Corp. reports for six months ended June 30, 1935, net profit of $693,105 which compares with net profit of $206,323 for the first half of 1934. Net profit for June quarter was $400,820 against $125,198 in second quarter last year.

Kendall Returns to Warren Nash Corp.

Richard H. Israel, acting president of Warren Nash Motor Corp., Nash-LaFayette distributor for the New York territory, has announced the appointment of Howard W. Kendall as wholesale manager. Mr. Kendall has been active in the automotive industry for 20 years. He was in charge of Warren Nash wholesale business from 1919 to 1923.

Steel Companies' Tax Bill $390,187,997 in 6 Years

Federal, state and local governments took 66.4 cents of every dollar of net income of 26 steel companies for taxes during the six-year period from 1929 to 1935, according to a report released by the American Iron and Steel Institute. The Institute's findings are based upon reports made to it by these member companies. Payments to the three principal governmental entities totaled $390,187,997 for the six years.

The Institute points out that the amount paid in taxes during the period in question is approximately equal to eight weeks' wages every year for each employee during that time. Net earnings of the 26 companies, after all charges except taxes and before dividend payments, aggregated $587,900,000. However, the Institute's report indicates that in no year since 1930 have the companies earned an aggregate income after all charges sufficient to pay all taxes.

Plymouth Motion Picture Portrays Accident Causes

"Everybody's Business" is the title of a motion picture produced in Hollywood for the Plymouth Motor Corp. to be shown in theaters throughout the United States soon as part of a national campaign to teach the principles of safe driving. The film, which was pre-viewed in Detroit by newspaper representatives and police officials, dramatically presents the major causes of motor car accidents by analyzing the reasons behind the sometimes fatal events which happen on streets and highways. Approved by the National Safety Council for national use under its auspices, the film contains no commercial trade names, but Plymouth cars are used in some of the sequences to dramatize the principles of safe driving.

McCord Payrolls Rise, Employment Gains 10%

Contrary to usual seasonal trend, payrolls of McCord Radiator & Mfg. Co. have been rising since May, current employment being up 10 per cent. Increased radiator business from one of the leading motor car manufacturers, which suspended production in its radiator department to make plant changes, the building up of inventories by the heater division and increased replacement business are responsible for McCord's sustained activity. The company finished the first six months this year with substantial gain in profits over the corresponding period last year, it was reported.

Packard Expanding Output Facilities for 120 Line

Packard Motor Car Co. is increasing its facilities for the manufacture of its "120" line. Work already has started in certain departments looking to this end, and additional tools and equipment will be purchased shortly.

CALENDAR OF COMING EVENTS

SHOWS

Machine Tool Show—Cleveland..Sept. 11-21
New York Automobile Show, New York, Nov. 2-9
Detroit Automobile Show.....Nov. 9-16
Buffalo Automobile Show .....Nov. 9-16
Newark Automobile Show.....Nov. 9-16
Cincinnati Automobile Show.....Nov. 10-16
Philadelphia Automobile Show..Nov. 11-16
Baltimore Automobile Show.....Nov. 16-23
Minneapolis Automobile Show....Nov. 16-23
Columbus Automobile Show.....Nov. 22-28
Cleveland Automobile Show.....Nov. 23-30
Montreal Automobile Show.....Nov. 23-30
Kansas City Automobile Show, Nov. 30-Dec. 6
Automotive Service Industries Show—Atlantic City .....Dec. 9-13

CONVENTIONS AND MEETINGS

S.A.E. National Production Meeting, Cleveland .....Sept. 18-19
National Industrial Advertising Association, Pittsburgh.....Sept. 18-20
American Transit Assoc., Bus Division, Atlantic City .....Sept. 23
National Assoc. Sales Finance Cos.—White Sulphur Springs.....Sept. 26-28
American Society for Metals, Annual Meeting—Chicago .....Sept. 30-Oct. 4
S.A.E. Transportation Meeting, Chicago .....Oct. 10
S.A.E. National Tractor Meeting, Chicago .....Oct. 10-11
National Safety Council, Louisville, Ky. .....October 14-18
American Gas Association—Atlantic City .....Oct. 14-18
Los Angeles .....Nov. 2- 9
S.A.E. Annual Dinner, New York....Nov. 4
Newark, N. J. .....Nov. 9-16
American Petroleum Institute—Los Angeles .....Nov. 11-14
Philadelphia .....Nov. 11-16
International Acetylene Association, Cleveland .....Nov. 12, 13, 15
Baltimore .....Nov. 16-23
National Industrial Traffic League—Chicago .....Nov. 20-21
Columbus, Ohio .....Nov. 23-28

Abrasive Machine Tool Co.
Acme Machine Products Co., Inc.
Acme Machine Tool Co.
Acme Machinery Co.
Acme Refining Co.
Ahlberg Bearing Co.
Ajax Mfg. Co.
Allen Company, Charles G.
Allis-Chalmers Mfg. Co.
Allis Co., The Louis
American Broach & Machine Co.
American Machinist
American Tool Works Co.
Armstrong Bros. Tool Co.
Arter Grinding Machine Co.
Associated Machine Tool Dealers.
Automotive Industries
Avey Drilling Machine Co.

Baker Bros., Inc.
Baker-Raulang Co.
Barber-Coleman Co.
Barnes Co., W. F. & John
Barnes Drill Co.
Barrett-Cravens.
Barrett Co., Leon J.
Bath & Co., John
Bausch & Lomb Optical Co.
Besly & Co., Chas. H.
Black & Decker Mfg. Co.
Blakeslee, G. S. & Co.
Blanchard Machine Co.
Bridgeport Safety Emery Wheel Co.
Bristol Company.
Brown & Sharpe Mfg. Co.
Bryant Chucking Grinder Co.
Buckeye Portable Tool Co.
Buffalo Forge Co.
Buhr Machine Tool Co.
Bullard Company
Bunting Brass & Bronze Co.

Carboloy Co., Inc.
Carborundum Co.
Carlton Machine Tool Co.
Carpenter Steel Co.
Century Electric Co.
Chicago Belting Co.
Cimatool Co.
Cincinnati Bickford Tool Co.
Cincinnati Lathe & Tool Co.
Cincinnati Milling Machine Co.
Cincinnati Shaper Co.
Cleveland Automatic Machine Co.
Cleveland Hobbing Machine Co.
Cleveland Twist Drill Co.
Cleveland Worm & Gear Co.
Colt's Patent Fire Arms Mfg. Co.
Cone Automatic Machine Co., Inc.
Cushman Chuck Co.
Cutler-Hammer, Inc.

Davenport Machine Tool Co.
Davis Boring Tool Co.
Dayton Rogers Mfg. Co.
Dayton Rubber Mfg. Co.
DeVlieg Milling Machine Co.
DeWalt Products Corp.
Diamond Machine Co.
Dresses Machine Tool Co.

Eastern Machine Screw Corp.
Eclipse Counterbore Co.
Eisler Engineering Co.
Elwell-Parker Electric Co.
Erie Foundry Co.
Euclid Electric & Mfg. Co.
Ex-Cell-O Aircraft & Tool Corp.

Fafnir Bearing Co.

Setting the Stage for th
And Most Instructive M

MARKING a new era in mechanical progress, the Machine Tool Show, which will be held at the Public Auditorium in Cleveland, will feature the product of 238 exhibitors. Of these there are 120 machine tool builders—members of the National Machine Tool Builders' Association—and 118 companies making accessories and related products.

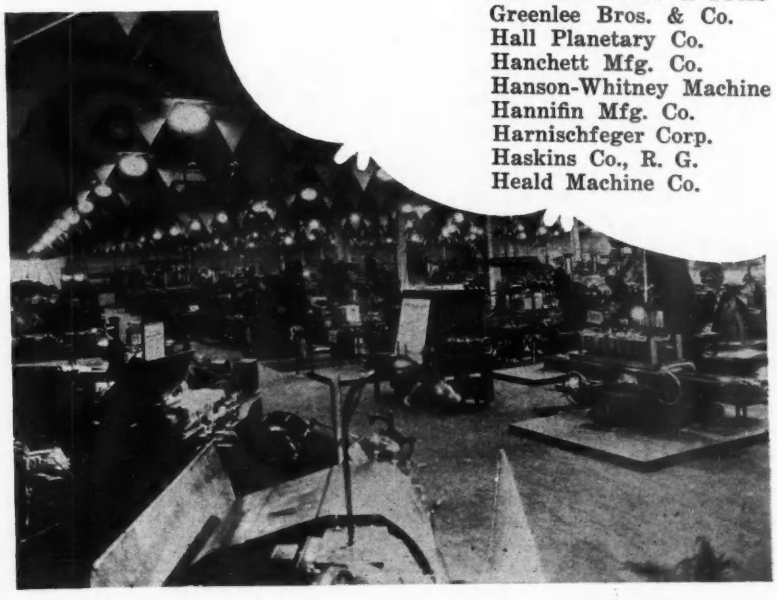
The exhibits will cover 235,000 sq. ft. or about 5.3 acres, probably the largest mechanical show of its kind held in the history of this country, according to H. H. Lind, general manager of the N.M.T.B.A., who made the announcement of show plans this week.

Included in the exhibit will be more than 900 metal working machines of about 600 different types, as well as hundreds of small tools, gages and other accessories, with a total value of about $4,000,000. The whole is to be in actual operation, constituting the world's greatest machine shop in action.

Thus, under one roof, the executives of the most important metal cutting industry in the world—the automotive industry—can see in operation the lat-

Exhibitors in the Machine Tool Show-A

Farrel-Birmingham Co., Inc. (Ansonia)
Farrel-Birmingham Co., Inc. (Buffalo)
Federal Products Corp.
Fellows Gear Shaper Co.
Firth-Sterling Steel Co.
Foote-Burt Co.
Fosdick Machine Tool Co.
Ford Motor Co.
Foster Machine Co.
Fostoria Pressed Steel Corp.
Fulton Foundry Machine Co.
Gallmeyer & Livingston Co.
Gardner Machine Co.
General Electric Co.
Geometric Tool Co.
Giddings & Lewis Machine Tool Co.
Gisholt Machine Co.
Gits Bros. Mfg. Co.
Gleason Works
Gogan Machine Corp.
Gorton Machine Co., George
Goss & DeLoeuw Machine Co.
Gould & Eberhardt
Gray Co., G. A.
Green Bay Barker Machine & Tool Works
Greenerd Arbor & Press Co.
Greenlee Bros. & Co.
Hall Planetary Co.
Hanchett Mfg. Co.
Hanson-Whitney Machine Co.
Hannifin Mfg. Co.
Harnischfeger Corp.
Haskins Co., R. G.
Heald Machine Co.



the World's Biggest Machine Tool Show

At Cleveland, September 11 to 21

by Joseph Geschelin
Detroit Technical Editor,
Automotive Industries

est mechanical equipment available today. Much of this equipment is so new that it will be seen for the first time when set up in Cleveland; other machines have been seen by relatively few people and are new to many of the automotive factory men.

A preview of most of the machinery to be exhibited in Cleveland will appear in the Factory and Production Issue of *Automotive Industries* to be published Sept. 7.

The Machine Tool Show this year is the third held by the National Machine Tool Builders' Association and is the first since the great Exposition in 1929. In the interim, we have witnessed the greatest development in equipment since the inception of mass production.

At the moment, the automotive industry is in the midst of its biggest wave of mechanical improvement since the banner year of 1929. Mechanization in this industry is not a matter

(*Turn to page 92, please*)

Hendey Machine Co.
Henry & Wright Mfg. Co.
Hobart Bros.
Hoefer Mfg. Co., Inc.
Houghton, E. F. & Co.
Hutto Engineering Co., Inc.
Hyatt Roller Bearing Co.
Hydraulic Press Mfg. Co.
Illinois Tool Works
Industrial Press.
Ingersoll Milling Machine Co.
International Nickel Co.
Iron Age, The
Jarvis Co., Charles L.
Jones & Lamson Machine Co.
Kearney & Trecker Corp.
Kent-Owens Machine Co.
King Machine Tool Co.
Kingsbury Machine Tool Corp.
Knight, W. K. Machinery Co.
Landis Machine Co.
Landis Tool Co.
Lapointe Machine Tool Co.
LeBlond, R. K. Machine Tool Co.
Lehmann Machine Co.
Leland-Gifford Co.
Lincoln Electric Co.
Link-Belt Company.
Lodge & Shipley Machine Tool Co
Logansport Machine Co.
Lucas Machine Tool Co.
Machinery
Madison-Kipp Corp.
Marlin-Rockwell Corp.
Master Tool Co.
Mattison Machine Works
McCrosky Tool Corp.

Micromatic Hone Corp.
Mill & Factory.
Modern Machine Shop
Monarch Machine Tool Co.
Morse Chain Co.
Motor Improvements, Inc.
Murchey Machine & Tool Co.
National Acme Co.
National Machinery Co.
New Britain-Girdley Machine Co.
New Departure Mfg. Co.
Norma-Hoffman Bearings Corp.
Norton Company
Oakite Products, Inc.
Ohio Machine Tool Co.
Oilgear Company
O. K. Tool Co., Inc.
Oliver Instrument Co.
Oster Mfg. Co.
Parker Appliance Co.
Peerless Machine Co.
Pellow Machine Co.
Penton Publishing Co.
Porter-Cable Machine Co.
Potter & Johnston Machine Co.
Power Transmission Council
Pratt & Whitney Co.
Producto Machine Co.
Q-C Engineering Products Co.
Racine Tool & Machine Co.
Railway Mechanical Engineer.
Reed-Prentice Corp.
Reeves Pulley Co.
Rivett Lathe & Grinder, Inc.
Robbins and Myers, Inc.
Rockford Machine Tool Co.
Rockwood Mfg. Co.
Rotor Air Tool Co.
Sellers & Co., Inc., William
Seneca Falls Machine Co.
Sidney Machine Tool Co.
S K F Industries, Inc.
Skinner Chuck Co.
Springfield Machine Tool Co.
Standard Tool Co.
Starrett Co., L. S.
Sterling Grinding Wheel Co.
Stuart & Co., D. A.
Sundstrand Machine Tool Co.
Sun Oil Company
Sythane Corp.
Taft-Pierce Co.
Taylor & Fenn Co.
The Tool Engineer.
Thomas Prosser & Son.
Thompson-Gibb Elec. Welding Co.
Thompson Grinder Co.
Timken Roller Bearing Co.
Toledo Scale Co.
Tuthill Pump Co.
Twin Disc Clutch Co.
U. S. Electrical Tool Co.
Union Mfg. Co.
Universal Boring Machine Co.
V & O Press Co.
Vanadium-Alloys Steel Co.
Van Norman Machine Tool Co.
Vickers, Inc.
Walker Co., Inc., O. S.
Warner & Swasey Co.
Wesson Co.
Westinghouse Elec. & Mfg. Co.
Whitney Metal Tool Co.
Wiedemann Machine Co.
Williams & Co., J. H.
Wilson Mechanical Instrument Co.
Yale & Towne Mfg. Co.

New Standardized Specification for Plates Are Proposed by

by Joseph Geschelin
Detroit Technical Editor, Automotive Industries

IN presenting its "Proposed Specifications for Leaf Spring Plates" to interested organizations in the automotive field, the Chrysler Corporation has crystallized into practical form an approach to the simplification of gage sizes and gage nomenclature in general.

General Motors, within its organization, pioneered a reform in practice along related lines a number of years ago. In effect, General Motors simplified the specification of sheet and wire sizes between 0.010 and 0.094 in., while Chrysler has established a new series of plate thicknesses for leaf spring stock between 0.145 and 0.625 in.

For a great many years efforts have been made to write a simplified gage nomenclature into drafting practice, but these efforts have been sporadic and generally have fallen by the wayside. To be effective, a reform of this nature must have strong leadership and must enlist the cooperation not only of the engineering fraternity but of the raw materials producers as well. Unless a code originates in this fashion it may be uneconomical and will fail to find general acceptance.

Recognizing the advantage of a simple code, the standards committee of General Motors developed after considerable experimental work the standards table shown in Fig. 1, covering the range of gage sizes for metal sheet, strip and wire. The first step in the process was the use of the decimal notation rather than by proprietary gages. As shown in Fig. 1, the various types of materials are grouped systematically according to the commercial gages in common use. The next step was to specify thickness, with only a few exceptions, to three decimal places only. Finally, the number of sizes for each type of material were reduced to a minimum, according to the dictates of practical production experience. As a result, for each type of material the standards table specifies only the thicknesses given by the heavy blocks.

To assure economical practice with respect to commercial sources of supply, the sizes given in the standards table lie within the commercial tolerances for each of the gage sizes now in ordinary use.

Thus we have a standard which simplifies drafting practice and eliminates the confusion arising from the use of gage designation. Moreover, it reduces the number of sizes now in use and accordingly should simplify the problem of stocking on the part of both the user and supplier. If it were generally adopted it would involve no hardship on the part of suppliers since the sizes lie within the range of commercial practice. This standard is now being used by several divisions of General Motors.

METAL SHEET, STRIP AND WIRE SIZES

This table is intended for all ferrous and non-ferrous sheet, strip and wire except wire and cable for electrical purposes. The use of this table eliminates the necessity of any reference whatever to gauge names or numbers. The heavy blocks shown below indicate commercial sizes of the various materials listed.

Size — For materials thinner than .010 specify the thickness required in decimals.	**Plate** Steel, Terne **Sheet** Steel & Iron, Plain, Galvanized & Tinned; Steel & Iron, Stainless; Monel Metal, Nickel **Strip** Monel Metal	**Bands & Hoops,** Steel & Iron **Sheet** Copper; Steel, Alloy, Spring & Unanne'l'd **Strip** Steel & Stainless Steel **Tubing, Seamless** Aluminum, Brass, Bronze, Copper, Nickel, Steel & Stainless Steel **Tubing, Welded** Monel Metal & Steel **Wire, Flat, Rd. Edge** Steel & Stainless Steel	**Rod, Sheet & Strip** Aluminum, Brass, Bronze, Copper & Nickel Silver **Tubing, Brazed** Brass, Bronze & Copper **Tubing, Seamless** Brass & Copper **Wire, Spring** Brass & Bronze	**Rod** Bronze & Steel Welding & Iron **Wire (except Music)** Iron, Stainless Iron, Steel & Stainless Steel	**Wire, Choker, Control & Music** Steel	Size — For materials thinner than .010 specify the thickness required in decimals.
.010	■			■	■	.010
.0105						.0105
.011	■			■	■	.011
.0115			■			.0115
.012	■			■	■	.012
.0125			■			.0125
.013	■	■		■	■	.013
.014	■					.014
.015	■			■	■	.015
.0155						.0155
.016	■			■	■	.016
.017						.017
.0175	■			■	■	.0175
.018						.018
.0185	■			■	■	.0185
.020	■			■	■	.020
.022	■		■	■	■	.022
.023						.023
.024	■					.024
.025	■		■	■	■	.025
.026	■					.026
.028	■			■		.028
.029						.029
.031	■		■	■	■	.031
.032	■					.032
.033						.033
.034	■			■	■	.034
.036	■		■		■	.036
.038	■					.038
.040	■		■	■	■	.040
.042	■					.042
.044	■					.044
.046			■			.046
.048	■					.048
.050	■			■	■	.050
.052						.052
.054	■			■	■	.054
.056	■					.056
.058						.058
.060	■		■	■	■	.060
.062	■			■		.062
.064						.064
.068						.068
.070	■					.070
.072	■			■	■	.072
.076						.076
.078	■					.078
.080						.080
.082			■			.082
.086						.086
.090			■	■		.090
.092					■	.092
.094	■	■	■	■	■	.094

NOTES: For materials thicker than .094 specify the thickness required in fractions or decimals.
For commercial tolerances see page Z-5. Special tolerances, when required, are to be specified on the drawing.
For sizes of electrical wire and cable see Vol. II
All reference to tubing applies to wall thickness. Diameters are to be specified in fractions

GENERAL MOTORS APPROVED STANDARD

Fig. 1—GM standard for sheet, strip and wire

for Leaf Spring by Chrysler

The Chrysler standardization proposal is based upon a very interesting background. According to Tore Franzen, Chrysler experimental engineer who developed the system discussed here, spring designers have often encountered difficult problems in the design of efficient leaf springs with the conventional B.W.G. and fractional sizes. As a matter of fact, spring users from time to time have demanded intermediate sizes to suit their requirements and this has been a source of annoyance to steel makers who on occasion have found it difficult to roll spring steel for stock.

In presenting the Chrysler tentative specifications, Tore Franzen describes it as a "new system of specifications in which the plate thicknesses no longer conform to the obsolete and irregular Birmingham Wire Gage sizes, but are based on a geometrical series of progression in which the factor of progression itself increases by a geometrical series. A flat section replaces the previously prevailing concave section. The terms have been worked out with a view to maximum possible interchangeability between designs made to old or new specifications. Thickness tolerances are slightly narrowed for the smaller sizes, although not nearly as much as tolerances already in use with important parts of the automobile industry."

Whether other organizations are prepared to accept this specification without change is a matter for conjecture. At least one group is not ready to abandon the concave section spring leaf at the moment, but this would not affect the value of the specification in general as a contribution to an ultimate new national standard. In fact, Chrysler is very open-minded about its proposal and expects certain changes to be made if and where justified.

The Chrysler process specification for leaf spring plates follows:

1. Chassis leaf springs shall be inspected for steel plate sizes and rolling tolerances in accordance with the following instructions.

2. Drawings shall specify one of the following sizes for plate thickness:

Inches	Inches	Inches
0.145	0.237	0.401
0.160	0.262	0.447
0.176	0.291	0.499
0.194	0.323	0.558
0.214	0.360	0.625

3. The finished bars shall be of flat (or slightly double concave) section with rounded edges.

TOLERANCES IN WIDTH, THICKNESS, AND CONCAVITY

Nominal Width		Width (Inches)		Thickness* (Inches)		Concavity** (Inches)		Maximum Difference in Thickness*** (Inches)
Over	To Inclusive	Plus	Minus	Plus	Minus	Plus	Minus	
0"	2½"	0.030	0.000	0.004	0.004	0.000	0.004	0.002
2½"	5"	0.050	0.000	0.006	0.006	0.000	0.006	0.003

*Thickness measurements shall be taken at the edge of the bar where the flat (or slightly double concave) surface intersects the rounded edge.
**Concavity is the difference in thickness at the center of the bar as against the thickness at the edges.
***Maximum difference in thickness between the two edges of each bar and along the entire length in the same bar.

4. The radii of the arcs of the two concave surfaces shall be of equal length.

5. Rolls to produce the round edges shall be turned to a radius not less than the thickness of the bar.

6. All bars shall be rolled to spring steel gages (see above) with tolerances as specified in table above.

7. Bars shall be free of "kinks" (gaps shorter than 3 in.), "waves" (gaps longer than 3 in. and exceeding 0.033 in.), and "twists" (side warping which exceeds 0.025 in. in 1-ft. length). Maximum curvature shall average not more than ½ in. in 20 ft.

8. Brinell hardness of the bars shall not be greater than 302, using a 3000-kilogram load and 10-millimeter ball.

A comparison in thickness between the new sizes and the "old" sizes now in practical use (Birmingham Wire Gages No. 9 to No. 2 inclusive for passenger car springs and fractional sizes from 5/16 in. to ⅝ in. inclusive for truck springs) will reveal that out of the 15 new sizes there are:

7 within 0.004 in. of the nearest old size.
3 more within 0.007 in. of the nearest old size.
3 more with 0.011 in. of the nearest old size, and only
2 *not* within 0.011 in. of the nearest old size.

We understand that the spring makers with whom Chrysler deals at the present writing have all accepted the spring standard. In addition, a group of five large steel mills have agreed to follow the practice outlined.

The foregoing standards proposed by two of the largest users of metals in the automotive field deserve the attention of forward-looking organizations in this industry. Concerted effort on the part of engineering departments in cooperation with raw materials producers should result in a simplification of procedure of benefit to everyone concerned.

A new code, if adopted by the industry, will eliminate much of the confusion in interpreting engineering drawings, will simplify the work of the purchasing and stores departments, and ultimately will be of tangible benefit to suppliers. In addition it should be a decided boon to the designing engineer.

Automotive Industries is glad to serve as a clearing house for suggestions and advice in this worthwhile project.

New Loadmaster Handles Up to Seven Tons

In addition to having the same mobility that features the smaller Loadmaster, the new Bucyrus-Erie CT-50 machine, made by the Bucyrus-Erie Co., South Milwaukee, Wis., provides greatly increased capacity and use of a longer boom.

This feature, plus fast crane-operating speed and ease of operation, well qualifies it for handling heavier industrial jobs. The machine has a lifting capacity of 13,900 lbs. at 12-ft. radius. The boom swings through an arc of 240 deg.

This crane is adaptable to practically every load and traction condition.

The CT-50 is unusually compact and flexible; when not required as a crane, it may be used for practically any job that a tractor of equal weight might be called upon to do.

New Equipment i Bu
Quantity, Qualit an

B. H. Newell, supt., Buick Foundry

View showing end of line where castings are shaken out

A HUGE development project involving extensive expenditures for equipment and installation was completed recently at the Buick foundry at Flint. Its chief objectives, according to B. H. Newell, foundry superintendent, were to produce better working conditions, lessen the manual effort on the part of foundry workers, increase the output of the plant, and to produce castings of better quality and uniformity, without scrap losses.

Admittedly this was a big order. But it has been carried out most successfully through the cooperation of the Buick foundry executives and various progressive manufacturers of foundry equipment. Without enlarging the plant in any way, daily output has been stepped up to 500 tons of iron alloy poured in nine hours. Improved working conditions are evident to anyone familiar with foundry operations, even upon casual examination.

The men in this plant are particularly proud of their investment in a battery of externally located oil-fired indirect air heaters of the recirculating type, which produce the heated atmosphere for the continuous core drying ovens. Since these heaters have been installed, check tests have shown that the cost of producing cores is considerably lower not only because less fuel is required but also because the percentage of rejected cores is greatly reduced. Heat variations throughout oven can be controlled tc within 2 deg. F. In addition there has been a general improvement in the quality of finished cores since the controlled system produces cores without underbake or green or overbaked regardless of the size of the core.

Apart from the new production equipment installed here, the most important development is the wider use of core blowing machines wherever they are suitable. This method greatly simplifies core production, eliminating pins, wires, vents, etc. Production costs naturally are lower, but the quality of the job is vastly improved and has a marked effect upon the facility with which successive operations are handled.

Another installation, unique in foundry practice, is a slag conveyor which carries the molten slag directly from the cupola vents and dumps it into a bin outside the building. Molten slag discharges directly into a deep trough where it is subjected to a stream of cold water which chills the mass and converts it into small light lumps. During the process the whole mass is pushed along by a metal drag chain which serves the double purpose of conveying as well as keeping the lumps down to fairly small size.

The entire operation is automatic and requires very little attention. Contrast this with the time-honored method of dumping the molten slag right onto the floor at each cupola where it has to be gathered, trucked out, broken up, and dumped.

Core ovens are heated by externally located, direct air heaters, equipped with syphon type oil burners, each oven being independently heated and controlled. Fuel oil is supplied to each heating unit from a central source, through an oil level control unit in which it is preheated to a suitable temperature for atomizing.

The air used for heating and ventilating is composed of a quantity of

Buick Foundry Improves and Working Conditions

fresh air, drawn from the building, mixed with recirculated air, drawn from the "discharge" or dry end of the oven. The mixture enters the heater and picks up sufficient heat from the products of combustion to establish and maintain the desired oven temperature. Hot air thus produced is conveyed to the oven by a high temperature fan, through a system of sheet metal ducts, having frequently-spaced adjustable outlets to assure uniform distribution within the oven.

Both heater delivery and oven temperature are automatically controlled and recorded, instruments being of the compressed air-operated type with diaphragm valves located on the atomizing air line. Safety devices are electrically operated and include flow switch protection against fan failure and pressure switch protection against atomizing air failure, both being inter-connected to a manual reset safety valve.

Oven exhaust, located at the "loading" or green end of each oven, is of the indirect induced draft type, providing means for purging heavy fumes, without passing them through the fan.

There is an initial installation of core blowing machines used for producing the cores for cylinder head, for manifolds, differential housings, port cores, and miscellaneous cores, Fig. 1 showing a view of the manifold set-up. Blowing produces cores so superior to hand ramming that it is possible to eliminate pins, wires, ramming vents, etc. Cores produced by this method are uniform in size and structure and so much lower in overall cost that the foundry management expects to add equipment of this type wherever it is adaptable.

Making and dipping crankcase barrel cores. Cores are made and then dipped green before baking. Dip tank rises and submerges core in blacking solution

Core blowing machine, blowing exhaust manifolds at the rate of 30 cores an hour per man. Machine makes 720 cores in eight hours

There is a new wrinkle in the finishing of cylinder barrel cores. Fig. 2 shows one of a battery of machines in the line. The cores are built up at stations to one side of the dip tank and then green-dipped in the tank. To accomplish this without the attendant vibration which might damage the core, the core is mounted on a rigid platform as shown, then the entire tank with its solution is lifted by an air cylinder to a height which completely immerses the core. The tank is then lowered, the core removed and loaded to the baking oven.

Fig. 3 shows a mechanized line preparing core assemblies for the cylinder block molds. The top subassembly, including water jackets and ports, starts at the left. Here the core sections are assembled in metal fixtures, gaged, lined up, inspected, and locked securely in place. The fixtures are then returned down the gravity roller conveyor to the starting point. From this point the assembly is carried through to a drying oven, dried and sent down to the final cleaning and inspection station.

We are told that this procedure has entirely eliminated previous difficulties and has cut rejects to the very minimum. All cores for the block are assembled in a huge master mold which automatically serves as an inspection device.

A large part of the molding machine equipment recently installed here was supplied by one of the leading makers in this field. The largest machines are the Jolt-Squeeze-Strippers, which are used for making cope and drag molds for cylinder blocks. These cope and drag machines are identical in design and operation. They jolt and squeeze ram the molds and then draw the pattern. At the finish of the draw operation the molds rest on rollers which permit them to be pushed out through the rear of the machine on roller conveyors.

Machines making cylinder block molds are divided into two groups, those making drags being in one group, the cope machines in the other. As the drag molds are completed, they are transferred from the roller conveyors at rear of the machine to the mold conveyor and are then carried on this conveyor through the core setting operations. Several cores are required for each block and all are set with jigs while the conveyor is in motion. By the time the drag molds reach the cope machines all the cores are set and the drags are ready for the placing of the cope molds.

Cope molds are taken from the roller conveyor at the rear of the cope machine, closed on the drag molds by means of an electric hoist and the completed mold carried by the conveyor through the pouring zone and the cooling zone, after which the castings are shaken out of the flasks. Flasks are returned to the molding machines by roller conveyor while the castings are hooked onto overhead cooling conveyor which cools them down to a suitable temperature for cleaning.

Similar machines are used in the production of crankcases, transmission cases, cylinder heads, clutch housings, the set-up for exhaust and intakes shown in Fig. 4. The method of producing these molds is, in general, the same as for the blocks; that is, drag molds are produced on the drag machines, placed on the conveyor where the cores are set and the molds made on the cope machines closed over the drags ready for pouring.

Two Jolt-Squeeze-Rollover Draw machines are used in making green sand cores for clutch housings. A jolt squeeze and strip machine makes the drag.

For making the green sand core,

Molding intake and exhaust pipes on jolt squeeze strip and roll out machines. Average production 90 molds per hour per machine

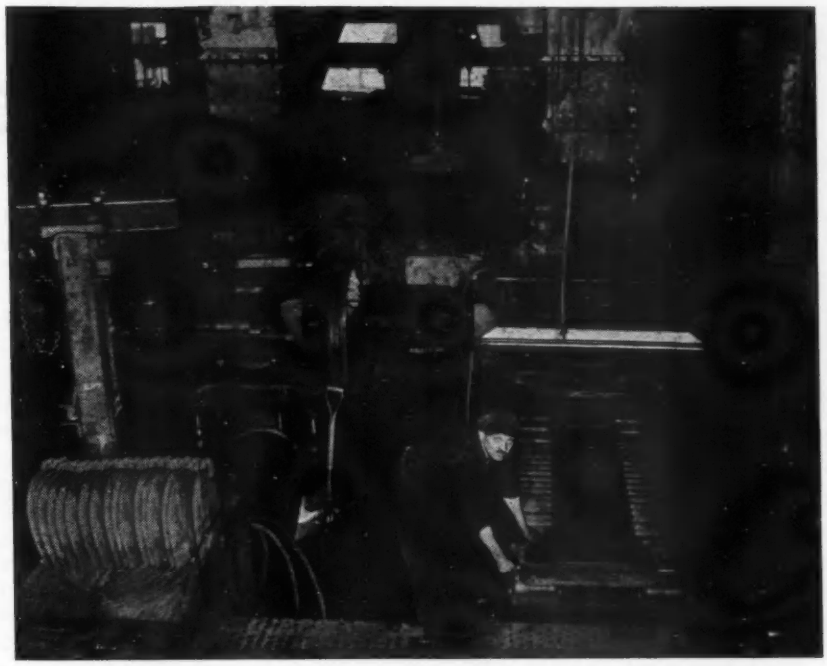
Portion of jacket assembly line. This line produces 90 complete assemblies per hour. Both male and female help are employed. Six different cores and 11 gages and fixtures are used on the line to complete operation

these machines are so built that the drag mold is first produced and then placed over the green sand core box, after the squeeze operation. The entire mold is then clamped, rolled over and drawn. (See Fig. 5.) After the draw is completed, the green sand core rests in position in the drag mold. This method makes the location of the green sand core a positive and simple operation.

Sand is supplied to all machines from overhead bins. Empty flasks and completed half molds are all handled on conveyors or by power hoists, excepting in the case of the very smallest molds. Thus, the operators are relieved of the heavy handling.

Another well-known foundry equipment manufacturer has supplied a battery of ten small molding machines of the type known as Jolt-Squeeze-Strip-Draw. These machines have found a wide field of usefulness in molding of many small miscellaneous parts.

As pointed out earlier, the motive behind this program of mechanization is many-sided. Obviously the improved methods of production, together with better control of the process, aid in cost reduction. Yet at the same time this program has resulted in better working conditions in general and in particular has served to eliminate much of the back-breaking labor usually associated with foundry work. In foundry work, mechanization and better control result in a product of superior quality and part of the cost-reduction comes not from the labor-saving of the machine as much as from the elimination of spoiled work and rejects.



Roll out end of molding machine making green sand core on flywheel and clutch housing. Drag is closed on core box, rolled and mold drawn complete. Production averages 90 to 95 molds per hour per equipment—8 men in crew

New Copper Alloy Has Unusual Properties

P. R. MALLORY & CO., INC., Indianapolis, Ind., has developed Mallory 3 Metal, a material of high electrical conductivity, great mechanical strength and greatly diversified application. Mallory 3 Metal is an alloy consisting predominantly of copper and is the equal of copper in coefficient of resistivity, coefficient of expansion, modulus of elasticity and corrosion resistance. The electrical conductivity of Mallory 3 Metal forgings and rods is rated at 80 to 85 per cent, that of copper or better. Sand castings of the Mallory 3 Metal will have an electrical conductivity of 75 to 85 per cent that of forged copper.

The physical properties of this new alloy are equally interesting and a comparison of them with those of copper, brass, bronze and steel is well worth the consideration of any mechanical or electrical engineer.

Mallory 3 Metal may be substituted, with few exceptions, for brass, copper, bronze, or even structural steel. It has already been used extensively for spot welding tips, flash welding dies and seam welding wheels. Mallory 3 Metal castings have proved successful in numerous applications where material of high strength and high conductivity is required.

Mallory 3 Metal, in addition, may be used successfully as a welding tip or wheel where proper water cooling is not obtainable.

Third Edition of "Timken Engineering Journal"

THE third edition of the *Timken Engineering Journal* has been issued by the Timken Roller Bearing Co., Canton, Ohio. It is a looseleaf journal with stiff covers and has a marginal tab index in addition to the customary detailed index sheet.

The first four sections cover the design of Timken bearings, with illustrations of the various types, a discussion of how they are rated, and numerous typical examples of how loads are calculated and bearings selected for various applications. Following a tabular section there is a section of detailed dimensions which is preceded by an index enabling the user to locate any bearing by series or number. Complete data are given on Timken shims, locknut and washer assemblies, annular groove closures, tubes, etc. The last two sections discuss cup and cone-fitting practice, giving definite recommendations, and also cover the subject of lubrication.

This third edition of the *Timken Engineering Journal* includes 54 new standard Timken bearings, and a new series of six heavy-duty thrust bearings. Eight new cups, two new annular ring closures and 12 new tubes are also listed.

Hutto Issues Bulletin

Hutto Engineering Co., Inc., Detroit, Mich., has just issued a bulletin describing the Hutto multiple speed, hydraulically-reciprocated honing and lapping machine. The MH 1800 H machine takes diameters from 1½ to 12 in. and long bores up to 13 ft. in length.

Reciprocating speed is infinitely variable from 0 to 50 f.p.m. while rotation speed is infinitely variable from 53½ to 252 r.p.m. One of these machines is in operation at the Rock Island Arsenal.

What the Wagner Labor Ac

ENACTMENT into law of the National Labor Relations Wagner-Connery) Act by Congressional action and Presidential signature has raised in industry the question of—what does the Act mean to industry?

The National Association of Manufacturers, recognizing the myriad ramifications and maze of legal technicalities of such legislation, has prepared an analysis of the Act, placing before employers a concise explanation of the measure's mechanism and application. Although there are many doubts concerning the Act's constitutionality which will not be resolved until a court test is made, meanwhile the government is going ahead with plans to administer it, which makes the new statute a matter of immediate concern to employers.

Three Aims

The Association's digest sums up the Act's purpose in three general terms: (1) to protect the rights of employees; (2) to prevent certain practices by employers, and (3) to establish procedure for determining what persons or labor organizations shall be exclusive representatives of employees for the purpose of collective bargaining.

In a general summary of the Act as a whole, the Association's study develops 13 principal objectives which are accomplished in fact by the law's passage. They are:

1. Establishes a National Labor Relations Board.

2. Fixes the general procedure to be followed by the Board.

3. Asserts certain rights of employees.

4. Outlaws certain unfair labor practices by employers.

5. Establishes the principle of majority rule.

6. Authorizes making of closed shop agreements under certain conditions.

7. Authorizes the Board to conduct elections, or otherwise to determine and certify the names of individuals or organizations designated for the purpose of collective bargaining.

8. Authorizes the Board to determine the unit of employment appropriate for the purposes of collective bargaining.

9. Authorizes the Board to prevent commission of the unfair labor practices enumerated in the bill, through issuance of cease and desist orders, and orders requiring "such affirmative action, including reinstatement of employees with or without back pay, as will effectuate the policies of this Act."

10. Authorizes the Board to utilize compulsory process in securing attendance of witnesses, production of evidence, and access to books, records and papers of any person being investigated or proceeded against under the sections of the Act covering employee representatives and elections and prevention of unfair labor practices.

11. Provides for court enforcement of Board orders on petition of the Board, and for review of Board orders on petition of "any aggrieved person."

12. Protects the Board and its agents against willful acts which "resist, prevent, impede, or interfere with" performance of duties under the Act.

13. Preserves the right to strike, without qualification.

The National Labor Relations Board, created by Section 3 with its powers, authority and duties prescribed in Sections 4, 5 and 6, is composed of three members appointed by the President. The Board may appoint attorneys, examiners, regional directors and other employees; it may establish or utilize regional, local or other agencies and voluntary or uncompensated services as it may from time to time see fit. The only limitation placed upon the Board in this respect is that it may not appoint conciliators or mediators or persons to do statistical work when these services can be obtained from the Department of Labor. Cases now pending before the old Labor Board, which ceases to exist upon appointment of the new Board, will not be transferred to the new body. The Board is not required to act as unit, any one of its members, agents or agencies may prosecute an inquiry necessary to the Board's functions in any part of the country and a Board member who participates in such an inquiry is not barred from subsequently participating in a decision of the Board upon the same case.

Rights of Workers

Section 7 of the Act enumerates the rights of employees, stating: "Employees shall have the right to self-organization, to form, join, or assist labor organizations, to bargain collectively through representatives of their own choosing, and to engage in concerted activities, for the purpose of collective bargaining or other mutual aid or protection." In this respect the Association's analysis points out that while the language is somewhat different from Section 7a of NIRA "in substance, however, the statement is the same."

Employers are primarily concerned with Section 8 of the Act, in which are enumerated the unfair labor practices from which employers are prohibited. Summarized by the Association, these practices are:

"1. To interfere with, restrain, or coerce employees in the exercise of the rights guaranteed in Section 7.

"2. To dominate or interfere with the formation or administration of any labor organization or contribute financial or other support to it: *Provided*, That subject to rules and regulations made and published by the Board pursuant to Section 6a, an employer shall not be prohibited from permitting employees to confer with him during working hours without loss of time or pay.

Closed Shop Exempted

"3. By discrimination in regard to hire or tenure of employment or any term or condition of employment to encourage or discourage membership in any labor organization: *Provided*, That nothing in this Act, or in the National Industrial Recovery Act, as amended from time to time, or in any code or agreement approved and prescribed thereunder, or in any other statute of the United States, shall preclude an employer from making an agreement with a labor organization (not established, maintained, or assisted by any action defined in this Act as an unfair labor practice) to require as a condition of employment membership therein, if such labor organization is the representative of the employees as provided in Section 9a in the appropriate collective bargaining unit covered by such agreement when made.

"4. To discharge or otherwise discriminate against an employee because he has filed charges or given testimony under this Act.

"5. To refuse to bargain collectively with the representatives of his employees, subject to the provisions of Section 9a."

Regarding paragraph 1 the Association points out in its analysis that

Means to Industrial Employers

coercion and restraint and interference may be held to be "many things which were originally considered normal and proper practices. . . . Thus, under the new Act, any conduct of an employer which is objected to by a labor organization, or by an individual employee, may become the subject of complaint and subsequent proceedings."

The Association questions whether the term "other support" can be construed as meaning "such things as furnishing a meeting place? Or contributing to outings or athletic activities of an organization?"

Discussing the third paragraph the Association says: "The field of discretion by the Board is very wide, since under its power to ignore the rules of evidence (provided for in Section 10b) it may use any means it sees fit to determine the state of mind of the employer, and to conclude that different treatment for different employees was a 'discrimination' for the purpose of 'encouraging or discouraging' one group or the other."

Paragraph 4 is held to be the least controversial because of its restricted field of operation, but of paragraph 5 the Association says it "is an obvious trouble breeder."

The Association further points out that "the term (collective bargaining) has been interpreted by the old Boards to mean that the employer must make every reasonable effort to reach and maintain an agreement with the representatives of the employees. . . . If, therefore, the employees' representatives submit a proposal asking for a substantial wage increase, and the employer submits a counter-proposal offering a very small increase, the Board might feel called upon to determine what, under the circumstances, would be a fair wage, thus the trend is directly toward wage fixing by Federal boards."

Elections

Section 9 provides for the designation and elections of employee representatives for purposes of collective bargaining, reserving to individual employees or minority groups of employees to present grievances to employers at any time (this latter portion refers to unorganized individuals or groups). In its study of the Act the manufacturers' organization says that "the majority of the employees in a unit . . . shall be the *exclusive* representatives of all the employees in such a unit for such purposes (collective bargaining)" and that "individual employees and minority groups may not, under this rule, be dealt with by the employer in respect of any of these subjects"—the subjects pertinent to collective bargaining such as wages, hours and conditions of employment. Under the provisions of this section the Board may take secret ballots or utilize any other suitable methods to ascertain such representatives.

What Is Interstate?

Under Section 10 the Board is empowered to "prevent any person from engaging in any unfair labor practice affecting commerce." The definition of "person" as contained in Section 2, paragraph 1, of the Act, is "one or more individuals, partnerships, associations, corporations, legal representatives, trustees, trustees in bankruptcy, or receivers." Of this provision the Association believes the term "any unfair labor practice affecting commerce" is "not susceptible to precise definition. The Act defines the term 'affecting commerce' to mean 'in commerce, or burdening or obstructing commerce or the free flow of commerce or having led to a labor dispute burdening or obstructing commerce or the free flow of commerce.' It is not clear from the Act, therefore, exactly when an unfair labor practice in manufacturing operations would affect commerce. Each case, apparently, must depend on its own facts as stated by the Supreme Court in its recent decision in the Schechter Poultry case. It is clear that an unfair labor practice by an employer engaged in manufacturing can be construed to affect commerce only when the effect is direct and substantial. In the vast majority of manufacturing operations, there is no such direct and substantial relation."

When an allegation of unfair labor practice is made against an employer the Board is empowered under Section 10b, c and d, to serve on the employer a complaint stating the charges, the complaint to contain a notice of hearing before the Board, any member or designated agent or agency, and the analysis indicates that "the Board may from time to time during the course of a hearing in effect issue new complaints in the light of testimony adduced. In other words, instead of making the proof correspond to the pleadings as is required in all courts of law and equity, the Board may in its discretion modify the pleadings to correspond to the proof. That this is the intention is clearly shown by the provision that in any proceeding the rules of evidence prevailing in courts of law or equity 'shall not be controlling.'" Employers may file answers to the complaint or amended complaint and appear in person or otherwise and give testimony.

When all the testimony has been taken the Board is empowered to issue a cease and desist order and in the language of the Act "to take such affirmative action, including reinstatement of employees with or without back pay, as will effectuate the policies of this Act." The Association is emphatic in its statement that the "importance of the latter provision cannot be overemphasized" because "no guide or standard whatever is provided in this matter, nor is the term 'affirmative action' defined or limited in any way in Sec. 2 of the Act (Definitions). The Board also may appeal to the Circuit Court of Appeals of the United States, having proper jurisdiction to enforce its order. The analysis points out that "the findings of the Board as to the facts, if supported by evidence, shall be conclusive. This, of course, means that there must be substantial evidence. The Court will determine how much of the matter admitted into the Board's record constitutes competent evidence." However, the Association says "it is important to bear in mind, however, that no punishment for contempt can be inflicted until the court has made a decree and it is violated." The Board also is empowered to subpoena witnesses and the production of evidence relating to any matter under investigation.

Wide Probing Powers

The Board is given wide investigatory powers for the purpose of hearings and investigation which it considers necessary. It is provided in Section 11, paragraph 3, that no person shall be excused from obeying a subpoena on the ground that to do so might tend to incriminate him or subject him to penalty or forfeiture. However, after having obeyed the order

(*Turn to page 92, please*)

Just Among Ourselves

British Plan in Shoal Water

THE British scheme for controlling used car allowances, which we described some weeks ago, already is in shoal water, our English contemporary, the *Motor Trader*, reveals. The trouble seems to be that makers with medium and small outputs who cater to a specialized and individual market, feel that the plan discriminates against them, a viewpoint which some manufacturers in about the same category in this country held on the motor vehicle retailing code. Two proposals have been made to meet this situation—one is that the plan apply only to cars selling under about $750, and the other that each manufacturer set the maximum allowances on used cars of his own make instead of depending on sales averages.

* * *

Karl Marx in a New Guise

PERSONALLY we can't see much difference between "production for use," an idea which we seem to be hearing more and more about, and the Karl Marx ideal of a society in which each would produce according to his ability and each would consume according to his need. We have no criticism to make of this ideal, but when we cogitate on putting it into practice in a world that seems to be made up largely of more or less selfish individuals, we just can't see how it could work.

It is inconceivable to us that at any near future date people can be induced to produce in proportion to their industry and ability, unless the rewards offered are in some degree commensurate. A dictatorship might attempt to force them to do so, but it would not be successful. Consequently it seems to us that before the Marxian concept, or its corollary "production for use," can ever become the basis of an economy, people must be educated to an entirely new concept of their social responsibilities. We doubt that people can be educated to that viewpoint but, if they can, it looks like a job requiring centuries.

* * *

Over-Crowding Dealers

BACK in June we reported in these columns that one important car maker was checking its distribution set-up in major cities as a preliminary move toward obtaining a better balance between potential and representation. At that time we pointed out that the tendency to pack too many dealers into big cities was one of the major causes of dealer insecurity in these communities.

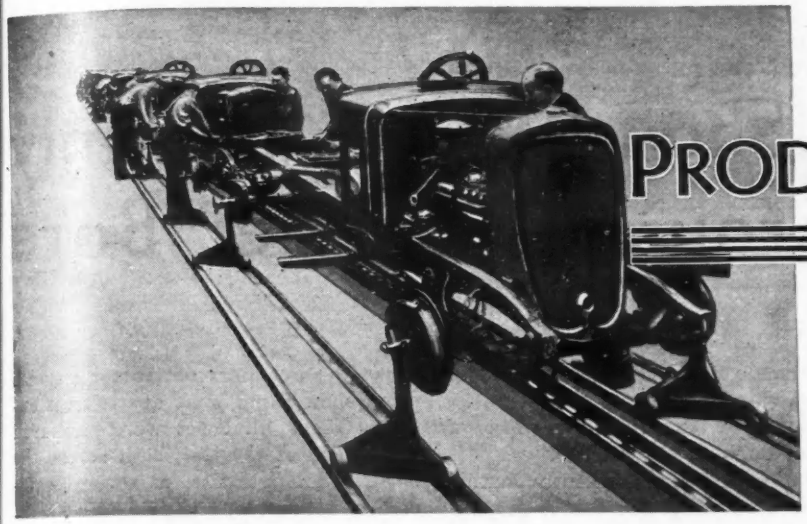
The car maker in question is General Motors and R. H. Grant, vice-president in charge of sales, in a recent speech in Texas, gave a broad outline of the field and home office research and analysis that is being carried on to this end. Commenting on the necessity for doing this work, Mr. Grant said: "If you put into a city 10 dealers where there should be six, and as a result of that if you get a fixed selling expense, that makes it impossible for most of those 10 men to make money, you will have done an awful lot towards having used car losses and every other kind of competitive trouble making. I can't conceive of any good constructive work being done in the direction of better selling, in the direction of better trading, or of any sound principles, in a city that is over-packed with dealers, and resulting in a higher overhead than the potential for business will maintain."

* * *

Closed Territories and Arbitration

MR. GRANT also discussed closed territory contracts, stating that he wouldn't hesitate to put it into effect, where it does not already apply, on the smaller volume GM lines . . . "but when you come to a line like Chevrolet, the closing of territory does not meet with the approbation of the average Chevrolet dealer. . . . I am not so sure but what the closing of the territory might in itself bring difficulties too."

Closed territories are admittedly a difficult thing to administer because it is not always easy to determine where justice lies, and also because the factory is always in the middle in these disputes. Some of these difficulties might be avoided, at least it would help to keep the factory field man out of hot water, by putting the administration job in the laps of the dealers. This might be done by making it a contractual provision that infringements are to be settled by arbitrators, one appointed by each party involved with a neutral third party and that dealers agree to abide by the decisions of the arbitrators. —D. B.



PRODUCTION LINES

Current Advance

We learn that some significant improvements are in the offing by way of electrical equipment for the 1936 cars. Generator characteristics have been given a rather thorough going over. Curves have been developed that show improved performance at high speeds. Generator size apparently is ample but better voltage control is expected.

Clean Air

Undoubtedly one of the cleanest foundries to be found anywhere is the unit operated by Bunting—producers of bronze alloy bushings of every description. Freedom from dust and fumes and smoke is achieved by a simple but expensive ventilating system that may well serve as a model. Each ladle used here runs on an overhead track which in turn is encased by a ventilating duct. The ladle, in addition, is covered by a hood from the time it receives its charge at the melting furnace. This hood exhausts the fumes at the start and continues the process even during pouring. There is more to it than this. But you may gather that this foundry is a mighty decent place to work in.

Designer's Guide

We understand that a number of large organizations have provided their drafting rooms with copies of a new and useful treatise—"Machine Designer's Guide" by K. W. Nadjer. It's a very interesting little book, combining sections on mathematical tables, construction of curves, graphics, strength of materials, etc. The value of the book lies in the arrangement of material and particularly Section V which deals with solution of practical design problems. Should be of real help to draftsmen, designers. Engineers who will find the compilation of data most useful. It contains five sections and runs 198 pages, printed by the Lithoprinting process by Edwards Brothers of Ann Arbor. Price $2.50.

Precision Grinding

One of the leading parts makers who also builds axles, guess who, has installed a battery of four Pratt & Whitney precision gear grinders. Nothing is too good for the present-day truck and bus axles. Grinding assures fine fits, freedom from backlash, longer life, and freedom from noise under heavy loads.

Battery Industry

"The Battery Industry at a Glance" is a little volume just issued by the statistical committee of the Natl. Battery Mfrs. Assn. Just as the title implies, it gives the statistics of the industry, markets, raw materials, etc. Available to nonmembers everywhere at 25 cents the copy.

Shop Practice

"Engineering Shop Practice—Vol. 2" by Prof. O. W. Boston of the University of Michigan is off the press. It follows close on the heels of Vol. 1 published last year and fills a definite need for an authoritative treatment of the modern types of production equipment now in common use in the metal working industries. Both volumes are so designed as to be of use as texts in engineering schools but both are equally valuable as reference books for the engineer and production man. Vol. 2, in addition to the subject matter on machine tools also covers such general topics as die casting, measuring instruments and gages, and cutting fluids. 485 pages, generously illustrated, at $5 the copy. John Wiley & Sons is the publisher.

Nickel Cast Iron

Some excellent material of recent origin on nickel cast iron alloys has been incorporated in a new bulletin by International Nickel. Much of this information, between the covers of a single bulletin, should be of great interest to metallurgists and engineers. Ask for Nickel Cast Iron Data, Sec. 1, No. 5.

Versatile Aluminum

When you design with aluminum you have at your command a score of basically different ways to obtain either a decorative or protective finish. Each of these methods has capabilities of wide variation. Altogether, they help you utilize the many inherent advantages of aluminum. You can design and build for appearance as well as performance.

Broaching Locks

Another car builder has adopted surface broaching for finishing engine bearing locks, making it almost unanimous. This is a high-priced job of moderate volume.

Very Close

We have just looked at some diesel injector parts fitted with tolerances rivalling anything we have seen for precision. For example there is a long bore 100 mm. in diameter, perfectly true, smooth, and straight. A piston is fitted to it with a clearance of 0.000004 in. Isn't that something?

—J. G.

MANUFACTURING MANAGEMENT METALLURGY

Measurements Show Wear Uniformly Distributed Around Cylinder Bore

ENGINEERS and mechanics repeatedly have had to change their views regarding the causes and distribution of cylinder wear. Up to quite recently it was the general opinion that wear was caused chiefly by abrasion, and the inference naturally was that it was confined almost entirely to the sides on which the piston bears by reason of the angularity of the connecting rod. In the early days of the industry it was even argued that the horizontal engine was at a marked disadvantage compared to the vertical engine because the weight of the pistons pressed them against the lower side of the cylinder wall and thus caused undue wear. One of the special constructions of that period, the offset-cylnder engine, was based on a similar reasoning, the object of offsetting being to decrease the angularity of the connecting rod, and consequently the pressure of the piston against the cylinder wall and the wear of the latter, during the power stroke while the gas pressure on the piston is high.

In recent years numerous measurements have been made on worn cylinders, and it has been found that the distribution of wear is by no means so uniform as this simple theory would lead one to expect. There is undoubtedly a certain amount of abrasion under conditions of poor lubrication, but the fact that the measured wear is practically always greatest at the belt covered by the top piston ring when the piston is in its highest position, indicates that abrasion can hardly be the principal factor in cylinder wear, because the relative motion between piston and cylinder when this portion of the cylinder wall is being contacted is practically nil. There appear to be two factors which have more effect on cylinder wear than the side thrust of the piston due to the angularity of the connecting rod, these being corrosion due to acids formed from the products of combusition when the cylinder-wall temperature is such as to permit condensation of the moisture in the exhaust, and distortion of the cylinder bore due to non-uniformity of wall thicknesses and other imperfections of form, or to unequal pull of cylinder head studs. That corrosion plays a big part in cylinder wear has been definitely proven by experimental work in England during the past year.

It has been claimed recently in this country that distortion has a preponderant influence on cylinder wear and in a multi-cylinder engine results in greater wear of the bore in the direction lengthwise of the block than across the block. The reason given is that the deck of the cylinder block exerts a greater restraining effect, preventing free expansion, in the lengthwise than in the transverse direction. It occurred to the writer that it would be well to check up this allegation on the basis of published data on cylinder wear. That cylinder blocks are distorted in service so that the bores are no longer of true cylindrical form is well established, but the trend of the evidence is that most of the distortion results from pull of cylinder head studs, in connection with an insufficient amount of metal around the stud holes. Distortion due to this cause is likely to be rather irregular, however.

by P. M. Heldt
Engineering Editor,
Automotive Industries

Considerable data on cylinder wear have been published in recent years and some of them are summarized below. Some of the figures are given to the fifth decimal point, which would seem to imply a degree of sensitiveness greater than can be credited to the instruments usually employed for such measurements, but this is due to the fact that the figures were converted from metric to inch measurements.

A farm-tractor contest was held in Germany in the Fall of 1925, and because the cylinders of tractor engines often show rapid wear due to dust entering them, all bores were measured at the end of the test, both across the block and lengthwise, at several equidistant points along their length.

In one four-cylinder engine, after 164 hours of field operation, the average wear of the bores at the top end was 0.00905 in. lengthwise of the block and 0.00885 in. across the block. In this case, therefore, the wear was greater lengthwise than across the block, but only about 2 per cent, which is probably within the "error of measurement."

In another one of the engines, after 164 hours of operation the average wear at the top end was 0.00915 in. lengthwise and 0.0118 in. across the block. In a third engine the wear at the top end was 0.010 in. lengthwise and 0.0108 in. across the block. If the figures for all three engines are averaged it is found that wear across the block (0.0105 in.) was about 10 per cent greater than the wear lengthwise of the block (0.0094 in.)

A somewhat different wear distribution would be expected for the middle of the length of the bores, because there the side thrust of the piston against the cylinder wall is more effective. There is, of course, no side thrust when the piston is at either the top or bottom of its stroke. The average wear of the bores of all twelve cylinders of the three engines referred to in the foregoing, at the middle of the length of the piston track, was 0.00505 in. lengthwise and 0.0058 in. across the block. Therefore, here too the wear is slightly greater across the block than at right angles thereto—roughly 15 per cent.

In *Automotive Industries* of April 1, 1933, we published charts of cylinder wear issued by the Elektronmetall Co. of Cannstatt, Germany, manufacturers of Bohnalite pistons. These relate to the wear of cylinder bores in automobile engines in regular service over 31,000 miles. In every case the wear all along the bore was greater across the block than lengthwise thereof, except that generally toward the lower end there was no noticeable difference. The wear was greatest in a low-priced four-cylinder car in which it measured

0.0134 in. (average) lengthwise of the block and 0.018 in. across the block. At the middle of the length of the bore the wear was about 35 per cent greater across the block than lengthwise thereof.

In the November, 1933, issue of The Automobile Engineer (London) there appeared an article on nitrogen-hardened cast iron by J. E. Hurst, which included a chart showing wear on cylinder liners along the bore, both across the block and lengthwise thereof, for a four-cylinder engine in 100,000 miles of service. The average wear at the top end was 0.010 in. across the block and 0.00625 in. lengthwise of the block. At the middle of the length of the bore the wear was substantially the same in both directions.

In *Automotive Industries* of May 13, 1933, were published wear curves for a six cylinder engine in bus service covering 68,500 miles. In cylinders 1, 4, 5 and 6 the wear was greatest across the block over the entire length, while in cylinders 2 and 3 the wear was greatest in the lengthwise direction over a considerable portion of the length of the bore. In cylinder No. 2 the wear in the direction of length of the block was materially greater than that across the block at the upper end of the piston track.

From Paul Dumas, of the Chilton Company Book Department and an official of the A.A.A. Contest Board, who supervised an endurance test of a Studebaker President car on Amatol Speedway, Hammonton, N. J., I learn that in the engine of that car, cylinders Nos. 4, 5 and 6 were 0.0015 in. in the lengthwise direction of the block, while the wear across the block for the same mileage was only 0.0005 in. These wear figures, of course, are exceedingly low, which is no doubt accounted for by the fact that the engine was run at high speed throughout the test and never cooled down, hence there was no chance for corrosion to occur. Owing to the very high speed at which this car was run throughout the test, the side thrust of the pistons against the cylinder walls must have been very high, and that there was only one-half of one-thousandth wear in 30,000 miles indicates that as long as the engine is kept up to normal temperature and cylinder lubrication is properly provided for, there is practically no wear from abrasion due to side thrust on the cylinder walls.

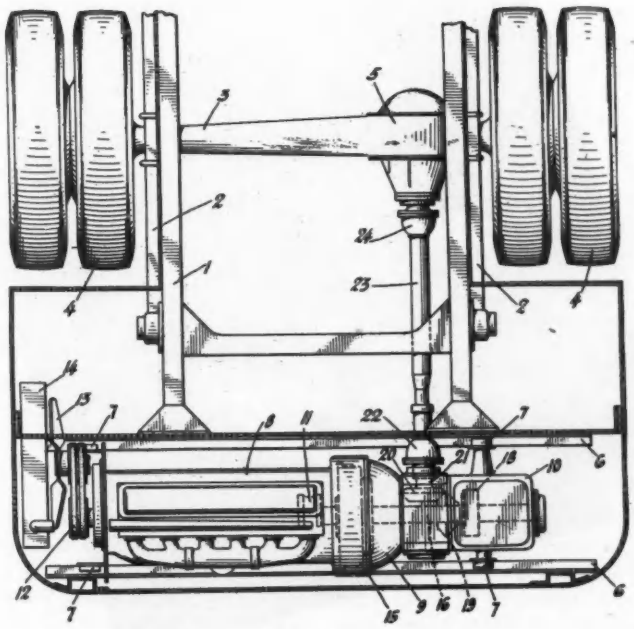
Summing up the data presented, it seems that as a rule, cylinder wear is substantially equal across the block and lengthwise thereof, over the whole length of the bore, and not, as one would be led to expect on theoretical grounds, much greater across the block. There are cases where the wear is actually greater lengthwise of the block than across it, but these are not as numerous as those in which the reverse condition obtains.

Yellow Gets Rear Engine Patent

A UNITED STATES patent of some importance to the motor bus industry at the present time, when the tendency is toward rear and underslung mounting of powerplants in buses, was issued to H. A. Flogaus recently and assigned by him to the Yellow Truck and Coach Manufacturing Co. The title of the patent is Rear-End Drive and the ground it covers is plain from the single claim which reads as follows:

"In a motor vehicle, a powerplant forming a part of the sprung weight of the vehicle and comprising an engine, a clutch, a transfer box and variable speed gearing arranged in transverse alinement successively at the rear of the vehicle, said variable speed gearing having input and output shafts arranged in spaced parallelism, with the input shaft extending through the transfer box between the clutch and variable speed gearing and the spaced output shaft terminating in said box for drive connection through the side thereof, a pair of driving wheels immediately forward of the powerplant, differential drive mechanism between said wheels in longitudinal alinement with said transfer box, and forming a part of the unsprung weight of the vehicle, a short length propeller shaft extending longitudinally of the vehicle and drive connecting the differential mechanism with the transfer box end of said output shaft and a universal joint associated with the propeller shaft to accommodate relative movement between the sprung and unsprung weights."

One of the two illustrations accompanying the specification is reproduced herewith:



Flogaus motor-bus rear-end drive

Special Appliance Is

by Fred B. Jacobs

Fig. 1—Checking gears for concentricity with bore.

Fig. 2—Tooth profiles are checked on Lees-Bradner machine for accuracy of tooth profile and tooth spacing.

THE Cleveland Tractor Co., Cleveland, Ohio, rigidly inspects every component before it goes into stock and an excellent example of the thoroughness of inspection is shown in the methods followed in testing gears.

All transmission gears for tractors are carburized and are given a Rockwell hardness test.

It is quite essential that all gears be free of high and low teeth and that the teeth are concentric with the bore. Gears are tested to note these errors by means of the appliance shown in Fig. 1. The gear to be tested is placed over a collet on a vertical shaft. Next a master gear is meshed with the first gear, the master gear being located over another vertical shaft. The two gears are located the correct distance apart. Then they are locked in position by setting up the lever shown in the foreground. The device is provided with a scale for making these settings accurately. The support for the gear in process of testing is movable. Thus when the dial indicator at the left is brought in contact and the gears rotated, any variation of the teeth or eccentricity between the pitch line and the hole in the gear will be detected instantly by movement of the indicator hand.

Used for Gear Inspection

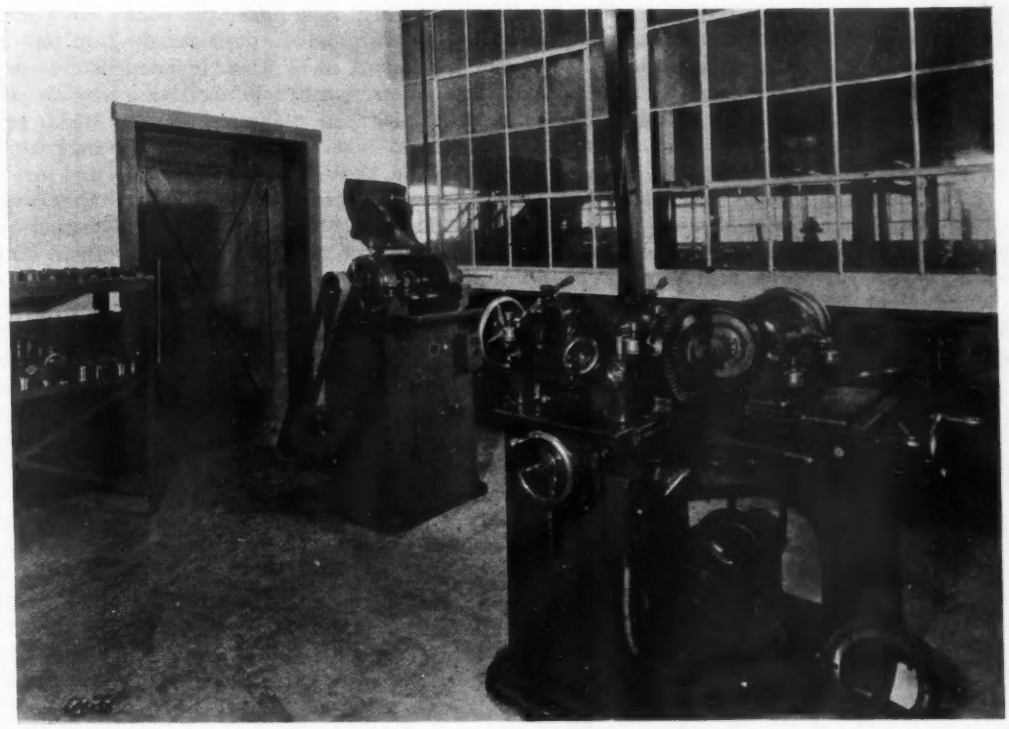


Fig. 3—View of sound proof room for final inspection of tractor gears. Gleason bevel gear tester in foreground; National Broach & Machine gear speeder shown in background.

A Lees-Bradner tooth testing machine shown in Fig. 2 is used to test tooth profiles and the spacing between the teeth. The movable head, which is free to rotate, is held by the inspector. The indicator arm on the movable head makes contact with the tooth faces and registers readings on the dial indicator. This fixture also tests the spacing between the teeth by means of two arms attached to the indicator. As contact is made at the same place on each tooth, any difference in spacing is immediately recorded on the indicator gage.

As a final inspection all transmission and bevel gears are subjected to an actual running test in which they occupy the same positions they will in finished tractors. These tests are conducted in a glass and tile sound proof room. This department, part of which is shown in Fig. 3, is equipped with a Gleason bevel gear testing machine shown in the foreground and a National Broach and Machine Co. gear speeder shown in the background. The department also is equipped with all the necessary arbors, bushings, etc., to adapt various gears to these machines. The Gleason machine can be speeded up to 1800 revolutions per minute. It has the necessary adjustments to set the gears in the exact relation to each other. By this test high and low spots are instantly detected and by means of the sound emitted the inspector can tell instantly if the gears meet predetermined standards.

Referring to the machine in the background in Fig. 3, two spur transmission gears are mounted for inspection, where the inspector listens to the sound of the running gears through a hole in the hood provided for the purpose. This machine can be speeded up to 1800 revolutions per minute. The machine is provided with a brake lever which puts a drag on the driven gear causing it to emit the sound it would have when working under actual conditions under load. Gears also are tested with red lead in this machine to reveal high spots.

While the foregoing tests may seem elaborate for heavy Diesel powered tractors, it should be borne in mind that these units are constructed on a precision basis and their accuracy is as close as that of a high grade American made automobile.

New Low-Pressure Tire For Light Trucks Produced

The U. S. Royal Fleetway "15," a new low-pressure tire for light trucks, is being announced by U. S. Rubber Products, Inc., New York. It is designed to fit a 15-5.50-F standard rim, and on this rim it measures 7.60 in. in width. It has a six-ply carcass designed for commercial service. A special tube with air-venting features and rubber valve steam is being made for this tire. The load-carrying capacity is 960-1400 lb., the corresponding inflation pressures being 14-25 lb. per sq. in.

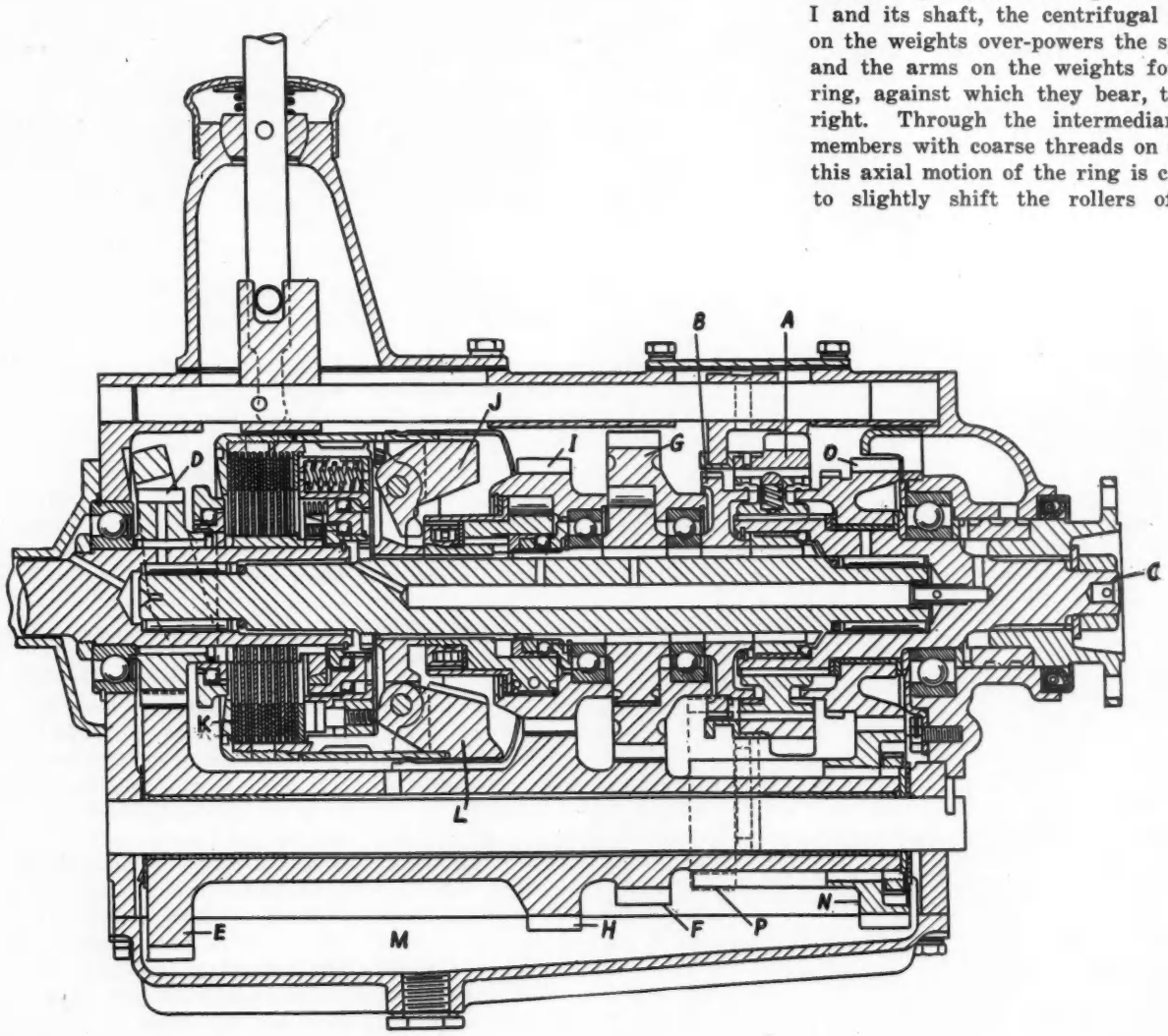
The Eclipse Controlle

A CONTROLLED automatic transmission giving three forward speeds and one reverse has been developed by the Eclipse Aviation Corp., Division of Bendix Aviation Corporation. It is used together with the conventional friction clutch controlled by pedal, and the transmission itself has a control lever or shift lever.

The design of the Eclipse transmission and its mode of operation can be best described by reference to the accompanying drawing representing a longitudinal section. To start the car, the flywheel clutch is disengaged by pressing down on the pedal, and the shift lever is set in the "forward-drive" position, which corresponds to the "high-gear" or direct-drive position with the conventional selective transmission.

When the shift lever is moved back into the "forward-drive" position, the clutch member A is shifted forward and then places member B in driving connection with the driven shaft C, the various members having suitable splines cut on them. If the flywheel clutch is now engaged by removing the foot from its pedal, the low gear train composed of gears D, E, F, G, takes up the drive, and the car starts forward at low speed. It will be seen that the low-speed driven gear G contains a roller clutch through which the drive is transmitted.

The car is now accelerated in low gear to any desired speed above 6 m.p.h. Then by momentarily closing the throttle, the second speed gear train comes into action ready to take up the drive. Engagement of the second speed roller clutch is brought about by a pair of pivoted weights J (of which only one is shown in the drawing) which rotate with the driven shaft and are subject to centrifugal force. These weights, when the car is not in motion, are held in a position close to their shaft by a coiled spring pressing against arms extending radially inward from the weights, and are restrained from moving outwardly when accelerating the car in low gear, by the action of a ball and cam mechanism located under the second speed roller race. When the speed of the car exceeds 6 m.p.h. and the throttle is closed to synchronize the speed of gear I and its shaft, the centrifugal force on the weights over-powers the spring and the arms on the weights force a ring, against which they bear, to the right. Through the intermediary of members with coarse threads on them, this axial motion of the ring is caused to slightly shift the rollers of the



Automatic Transmission

roller clutch gear I, angularly, the motion being transmitted to the rollers through a roller cage. In this way the rollers are wedged in between the cam and the bore of gear I ready to take up the drive when the throttle is again opened. The first-speed driven gear G now "free-wheels."

Acceleration of the car is now continued in second to any desired speed above 18 m.p.h. when, by again momentarily releasing the throttle, the high speed friction disc clutch K (or direct drive clutch—shown at the left in the gear box) is engaged by means of a second set of centrifugal weights L (of which only one is shown in the drawing). These weights are provided with a nose each, which, when the weight moves out from the axis of rotation under centrifugal force, presses against spring covers containing the springs of the high speed clutch. Through these springs the weights L press against the clutch pressure plate to engage the clutch. The drive is then direct, and the driven gears of both the low and second speed trains "free-wheel." Both sets of centrifugal weights are carried by the drum of the high-speed friction clutch K.

A small cone clutch in conjunction with a ball-and-cam device located immediately back of the disc clutch K acts to open up the clutch and release it of all pressure while accelerating the car in both low and second gear. Therefore, in the low gears this clutch slips without load regardless of the centrifugal effect of the clutch weights.

The car is now accelerated further and the drive continues in direct as long as the torque requirements do not exceed the capacity of the friction clutch, which capacity is determined by the centrifugal force of the weights at any given speed. At 18 m.p.h. the clutch normally has sufficient capacity to take full engine torque without slipping.

There is a direct mechanical connection between the accelerator pedal and the pressure plate of clutch K, by means of which clutch K is opened positively if the accelerator pedal is depressed beyond the position corresponding to full-open throttle. As soon as slipping of the clutch begins, the latter is opened completely by the control mechanism previously described, and the drive then continues in second gear.

To change from second gear to low, the car speed must be brought down sufficiently so that the spring overcomes the centrifugal force on weights J. When this occurs, and provided the second-speed gears are momentarily relieved of torque by releasing the accelerator pedal, the rollers are moved out of contact with the cam, and the second-speed gear is freed, whereupon the low-speed gear takes up the drive.

Thus the upward shift, from low to second and from second to high, is accomplished by first accelerating the car to a speed suitable for the change and then releasing the accelerator momentarily, when the change-over occurs automatically. Changing down to second ordinarily occurs automatically when the torque load becomes too great for the direct-drive clutch to handle, but can be accomplished at any time at the will of the operator by pressing down the accelerator pedal beyond the point of "full throttle." Changing to low speed is accomplished by slowing the car down further and then momentarily closing the throttle. The controlled change to second gear is particularly valuable when ascending hills which cannot be made in high, as in that case it would not be desirable to let the car slow down to the speed at which the change would take place automatically, which would result in too much loss of momentum.

At the extreme rear of the transmission there is a pair of gears N, O referred to as the auxiliary second-speed gears. These are engaged by moving the shift lever forward, which first synchronizes the two members to be coupled together and then couples them positively. When this gear is in operation, oil is thrown into a pocket over the rear bearing, from which it is conducted through radial and axial oil holes to the various bearing surfaces of the transmission. Reverse is obtained by means of a pair of reverse pinions P on a third shaft which are engaged by means of the regular shift lever.

All gears of the transmission with the exception of those for the reverse are cut with helical teeth and are therefore silent.

Frictional and Leakage Losses With Piston Rings

Reibungs—und Undichtigkeitsverluste an Kolbenringen (Frictional and Leakage Losses with Piston Rings), by Dr. H. Ing. M. Eweis. Forschungsheft (Research Report) No. 371 of the German Society of Engineers. Published by VDI Verlag, Berlin NW-7.

THIS report deals with research work on piston rings, the first part being theoretical and the second experimental. In the experimental work the piston with the measuring instruments was held stationary while the cylinder was reciprocated. In order to be able to measure the frictional force alone, the cylinder had to be relieved of gas pressure on both sides. Pressure behind the rings was produced by compressed air blown into the ring grooves between pairs of rings. Cylinder pressures were measured with electrical indicators, for from two to six piston rings and piston speeds up to 400 ft. per min. Pressure variations were found to be in accordance with conclusions from theoretical reasoning. The guide of the cylinder liner was electrically heated, so the oil could be kept at a uniform temperature.

Piston friction was determined for the condition of constant gas pressure as well as for that of cyclic variations of gas pressure, for operating temperatures up to 250 deg. Fahr. Because of the low maximum piston speed of 400 ft. per min. only the field of boundary lubrication was covered.

The tests on leakage led to the conclusion that a good seal between ring and seat is of the highest importance. Leakage losses decrease rapidly with increase in piston speed.

World's Largest Machine Show

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of figuring out ways and means of replacing men; it is a conscious program of making things at less cost to the ultimate consumer, thereby widening the use of automotive equipment and ever increasing the demand for more manpower. True, man-hours per unit of product are less but the total employment is ever on the increase. Only through this process, as a matter of fact, has it been possible to lift the level of income of wage-earners to what it is in automotive communities.

Moreover, the progress of mechanization in recent years has been concentrated not only on cost-reduction but even more so on the development of methods that remove more and more of the manual effort on the part of the operator. This is particularly striking in many specialized fields, such as the foundry industry, for example, where the back-breaking manual labor usually associated with foundry work has been transferred to the machine.

1929 Show Opened New Vista

At the Machine Tool Show of 1929 the metal-cutting world was promised a new vista of performance by the introduction of cemented-tungsten-carbide. Since that time it has been a promise fulfilled not only through the improvement in this tool material but also in the development of machine tools capable of utilizing the cemented-carbide tooling and other tool materials such as Haynes Stellite.

The machines to be shown at the coming show in Cleveland are great rugged pieces of equipment, capable of high speeds and feeds, husky enough to take heavy cuts for roughing, and with inherent precision that permits metal cutting within hitherto unheard of manufacturing limits.

For 1935 the show will be a vast machine shop in action. It will give production executives a first-hand picture of the real stature of mechanization. It will present a marvelous opportunity to see what is available; it will enable one to check his own equipment, no matter how recent, with what the market affords.

Executives responsible for parts production will see the gamut of special as well as semi-automatic machinery that may well solve many of their problems of cost reduction on a jobbing scale.

But most important of all, the top executives of the manufacturing organization can see at first hand the real power and potentialities of modern equipment and can gain a better appreciation of what it can do in their own plants. It has been difficult to visualize the advantages of modern equipment simply through the medium of accounting figures. Here is a signal opportunity to see the new equipment at work and compare its advantages with those of the old familiar tools.

Times have changed, more of the burden of factory operation has shifted to the financial executives of the company. Today the responsibility of keeping a manufacturing organization abreast or ahead of competition depends upon the ability to apportion the resources of the company so that the budget of available funds for needed equipment will bear a logical relation to the other activities. The evidence of the show will be a revelation to the fiscal officer who is seeking ways and means of furthering a profit-making business.

Running concurrently with the show will be the Machine Tool Congress with outstanding organizations cooperating. Thus there will be technical programs arranged by the American Society of Mechanical Engineers, the Society of Automotive Engineers, and the American Society of Tool Engineers. These programs encompass the community of interests of the technical and non-technical men coming to Cleveland and will make their stay most profitable.

What Wagner Act Means

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of the Board no individual shall be prosecuted or subject to any penalty or forfeiture as the result or such obedience after he has claimed his privilege against self-incrimination. However, this provision does not secure any person against prosecution for perjury in connection with his testimony.

The right of employees to strike is guaranteed in Section 13, and of this section, already quoted, the Association states: "It is to be noted there is no control over contracts or conduct of labor organizations. They are as free as before the passage of the Act to call and conduct a strike even against an adverse decision. Such a strike may even operate as a willful interference with the activities of the National Labor Relations Board."

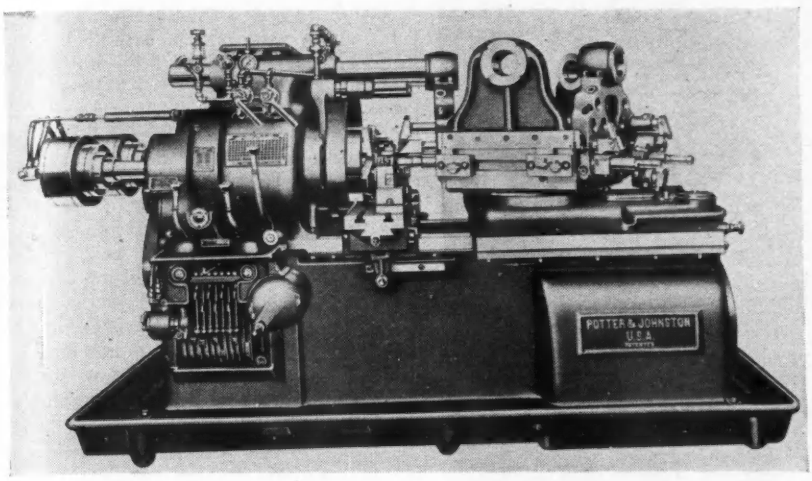
Copies of the complete analysis of the Act made by the National Association of Manufacturers may be obtained free from the Association through its Washington office in the Investment Building.

"Greaseal" Extends Bearing Size Line

The Norma-Hoffman Bearings Corporation of Stamford, Conn., announces that its "GreaSeal" line of Felt-Protected Precision Ball Bearings has been extended to include three larger sizes—40, 45 and 50 millimeter bore. The "GreaSeal" line includes three series:—"7000", with single felt seal; "7000-P", with single-felt seal and plate shield; and "77000", with double felt seal. The two latter series are fully enclosed, for retention of lubricant and exclusion of dirt and moisture. All three of these "GreaSeal" types are self-contained units distinguished by the removable felt seal consisting of thick, closely-fitting felts between removable plates—forming an effective labyrinth against the recessed inner ring. The felt seal, being completely within the confines of both rings, is not exposed to injury. The wide, solid inner and outer rings make inserts in the housing unnecessary, and safeguard against looseness, slippage, and escape of lubricant past the outer ring. The seal construction is such that all distortion of the ball races is avoided. This, with extreme Precision, makes for quiet running. The grease capacity in all three "GreaSeal" types is ample for long periods of service, without renewal.

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools



P & S Automatic Chucking Machine

A two-spindle, Power-Flex automatic chucking machine, 5-D-2, has been placed on the market by the Potter & Johnston Machine Co., Pawtucket, R. I. It is said to incorporate maximum flexibility and great productive capacity. The machine is provided with twenty-eight speed changes ranging between 19 and 613 rpm., arranged in seven sets of four automatic changes.

24 feed changes are available in three groups of automatic changes —coarse, medium, and fine. Feed gearing is driven from the spindle, thereby producing a definite relation between speeds and feeds. An automatic spindle stop is provided allowing cutting tools to return to the neutral position.

The cross slide cam drum is located directly under the cross slide and the ball bearing cam roll studs are mounted in the cross slide, thus furnishing a direct connection. The cam drum is carried in a compartment at the rear, outside the base ways, and is readily accessible for the application of special cams.

The turret slide is of rigid construction, and is provided with hardened and ground steel inserts to form its bearing on the base ways.

The turret is automatically clamped in position after indexing. All parts of the geneva revolving mechanism, subject to strain, are made of alloy steel, heat treated. The turret lock bolt engages with an index plate of large diameter and operates between an adjustable taper gib and a hardened and ground steel plate against the positive side. Five turret faces are provided for the mounting of tools.

The machine is provided with power operated automatic clutches under dog or hand control. *All changes of speed and feed may be accomplished readily while the machine is under cutting load. As the clutches are engaged and disengaged by power, the dogs are under no strain and are simply used to select the desired speed or feed.*

Air or electrically operated chucks can be supplied when so ordered. All chucks are provided with means for locating pilot bushings. Net weight about 14,000 lb.

Carbon Resistor for Electronic Control

It is now generally accepted that the operation of electronic, selective and control apparatus can be improved by the introduction of low-resistance units in the circuit, thus producing a more uniform sensitivity curve.

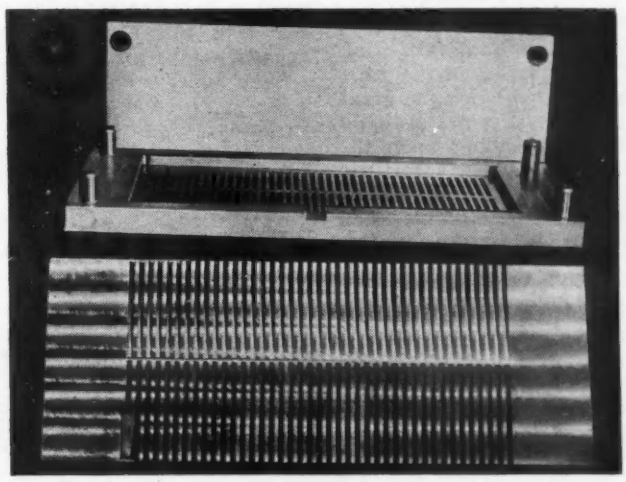
To fill this need, The Ohio Carbon Co., Lakewood, Ohio, is manufacturing a new type of low-value resistor using carbon—the non-inductive properties of which give it important advantages over wire-wound low-resistance units. Values as low as 0.04 ohm, in capacities from one-quarter watt to 10 watts, are available. In producing these new "Ohiohm" low-value carbon resistors (which are known as the "LV" series), no losses have been sustained as to their load, voltage, life, overload and humidity characteristics as compared with the company's well-known line of "Ohiohm" resistors of higher ohmic values.

All-Steel Die Sets Produced by Danly Methods

For some time Danly Machine Specialties, Inc., Chicago, Ill., has been producing special die sets from steel plate by the torch-cut and welding method.

The fact that these Danly all-steel die sets found such a wide field of use led to the study and the development of a standard line of all-steel shoes and punch holders. Much of this work was done in connection with the tool engineers of leading automotive companies.

As a result, eight types were selected as most useful to the industry and series of standard sizes developed covering a wide spread of dimensions. These sizes, however, while carried as standard for immediate fabrication and shipment from Chicago, by no means limit the possibilities as any size or shape can be very quickly made by this same method. Complete plate stocks are carried in all thicknesses from 1 in. to 6½ in.



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New Features in Kent-Owens No. 26 Milling Machine

Kent-Owens Machine Company, Toledo, Ohio, has just announced the No. 26 milling machine, which incorporates several new features. Table feed is cam controlled, which permits any desired cycle of automatic table movement. It is applicable especially to high production jobs or long runs requiring maximum machine economy. A cushioned belt drive to the spindle assures smooth cutting with an absence of backlash. Standard equipment permits spindle speeds to 2000 r.p.m., although higher speeds can be provided.

The usefulness of this milling machine is broadened by its adaptability for special automatic fixtures and special cutter arrangements. A table working surface of 36 in. x 8¼ in. with three tee slots permits the mounting of two fixtures, one of which can be unloaded and loaded while the other is under the cutter.

A multiple plate clutch assures smooth engagement and instantaneous release. The cam may be disengaged by the operator at will. This machine may be turned by hand throughout its complete cycle to facilitate setting up and making adjustments.

Extension Link for Collapsible Taps

To tap threads that are longer than provided for with standard taps, the Landis Machine Company, Waynesboro, Pa., has designed a special link for use between the body and head of their Style LT collapsible taps and Style LM receding chaser collapsible taps. This construction is possible because on these taps the head is made detachable from the body to permit the use of heads of different sizes on the same body.

The extension link is machined on one end and drilled and tapped to fit the tap body while the opposite end is prepared to fit the tap head. This permits using a standard body and a standard head instead of requiring the special manufacture of these parts. Any length of link can be provided for the length of thread desired.

This link can also be used on a tap required for reaching to the bottom of a deep hole even though a short length of thread is required. If a short length of thread is also to be tapped, the link can be removed and the head attached directly to the body, making a standard tap.

New Rubber Covering

Self-Vulcanizing Rubber Co., Inc., 605 West Washington Boulevard, Chicago, Ill., has just placed on the market a rubber covering for a great variety of purposes. It comes in liquid and plastic form depending upon the manner in which the rubber coating is to be applied.

The application of "Self-Vulc" has recently been improved by the development of a new priming compound, which makes good results possible by the application of a single priming coat; and both the priming and liquid rubber can be applied just like paint —brushed on, sprayed on, dipped on, or poured on. The rubber vulcanizes itself when exposed to the air. "Self-Vulc" plastic is applied with a spatula or other flat tool and like the liquid, requires only one prime or preliminary coat and vulcanizes itself cold, when exposed to the air.

"Self-Vulc," liquid or plastic, is being applied for the following general purposes:

1. To protect inside and outside surfaces against abrasion, corrosion, acids.

2. To restore surfaces of all kinds of material which have been worn away by abrasive action, acids and their fumes.

3. To water-proof or corrosion-proof all kinds of containers and surfaces.

4. To absorb shocks on surfaces subjected to impact, and thus prevent bending and breakage as well as abrasion.

IAA Meets in Cleveland

The International Acetylene Association will hold its 36th annual convention this year in Cleveland at the Cleveland Hotel on November 12, 13, 14 and 15, according to the association's secretary, H. F. Reinhard.